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# 1987

## Census of Manufactures

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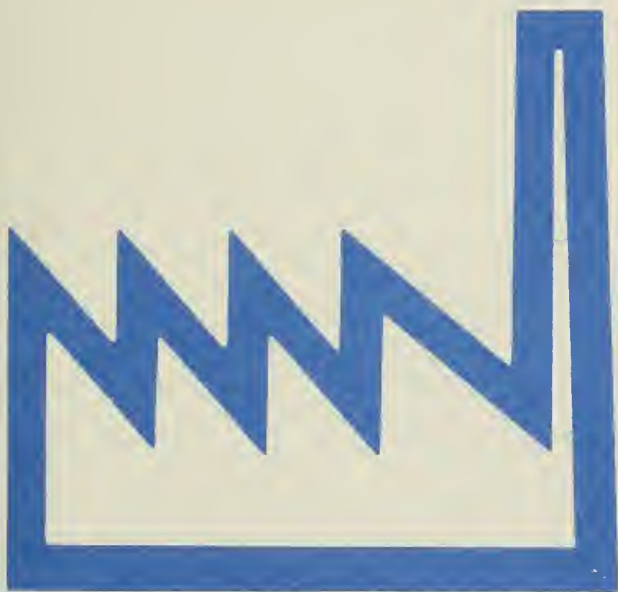
MC87-I-35F

INDUSTRY SERIES

### Office and Computing Machines

Industries 3571, 3572, 3575, 3577, 3578,  
and 3579

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# ACKNOWLEDGMENTS

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Many persons participated in the various activities of the 1987 Census of Manufactures.

The overall planning and review of the census operations were performed by the staff of the Office of the Assistant Director for Economic and Agriculture Censuses.

This report was prepared in the Industry Division. **John Govoni**, Assistant Chief for Census/ASM Programs, was responsible for the overall planning, management, and coordination of the census of manufactures. Planning and implementation were under the direction of **Kenneth I. Hansen**, Chief, Census/ASM Durable Branch, assisted by **Charles T. Lee, Jr.**, Section Chief, with primary data analysis responsibilities performed by **JoAnna T.Q. Nguyen**.

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If you have any questions concerning the statistics in this report, call (301) 763-7304.

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# INTRODUCTION

## PURPOSE AND USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source of facts about the structure and functioning of the Nation's economy. They provide essential information for government, business, industry, and the general public.

*Economic censuses furnish an important part of the framework for such composite measures as the gross national product, input-output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.*

*Policy-making agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.*

*State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.*

*Trade associations study trends in their own and competing industries, and keep their members informed of market changes.*

*Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.*

## AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic censuses every 5 years, covering years ending in 2 and 7. The 1987 Economic Censuses consist of the

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Transportation
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1987 Census of Agriculture and 1987 Census of Governments are conducted separately.) The next economic censuses are scheduled to be taken in 1993 covering the year 1992.

## AVAILABILITY OF THE DATA

The results of each of the economic censuses are available in printed reports, for sale by the U.S. Government Printing Office, and on microfiche, computer tape, compact discs with read-only memory, and flexible diskettes, for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Census Bureau, Washington, DC 20233. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State Data Centers in every State and Business and Industry Data Centers in many States also supply economic census statistics.

## WHAT'S NEW IN 1987

Several changes have taken place for the 1987 censuses. Data will be reported on the basis of the newly revised Standard Industrial Classification (SIC) system with selected reports including "bridge tables," linking the old and new classification systems. A new set of metropolitan areas has been adopted, and more detailed information will be available for businesses with no paid employees. For additional information on these changes, review the subsequent text.

## HISTORICAL INFORMATION

The economic censuses have been taken together as an integrated program at 5-year intervals since 1967, and before that for 1963, 1958, and 1954. Prior to that time, the individual censuses were taken separately at varying intervals.

The economic censuses trace their beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial



activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 manufactures census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade, and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 economic censuses were the first to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. These were the first censuses to be taken by mail, using lists of firms provided by the administrative records of other federal agencies. Since 1963, administrative records have also been used to provide basic statistics as well for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic censuses, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The Census of Construction Industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The Census of Transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks. New for 1987 are publications reporting on business establishments engaged in several transportation industries, paralleling the data on establishments in other sectors. This is part of a gradual expansion in coverage of industries previously subjected to government regulation. The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic censuses in 1972 along with the Survey of Women-Owned Businesses.

Economic censuses have also been taken in Puerto Rico since 1909, in the Virgin Islands and Guam since 1958, and in the Northern Mariana Islands since 1982.

Statistical reports from the 1982 and earlier censuses provide historical figures for the study of long-term time series, and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

## **AVAILABILITY OF MORE FREQUENT ECONOMIC DATA**

While the censuses provide complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, the results of which appear in publication series such as *Current Business Reports* (retail and wholesale trade and service industries), the *Annual Survey of Manufactures*, *Current Industrial Reports*, and the *Quarterly Financial Report*. Most of these surveys, while providing more frequent

observations, yield less kind-of-business and geographic detail than the censuses. The *County Business Patterns* program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

## **SOURCES FOR MORE INFORMATION**

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1987 Economic Censuses and Related Statistics*. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1987 Economic Censuses*. Contact Customer Services for information on availability.

## **CENSUS OF MANUFACTURES**

### **General**

This report, from the 1987 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as type of organization, distribution of sales by class of customer, concentration ratios and water use in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan statistical areas (MSA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MSA's with 250 employees or more and for counties and places with 450 employees or more.

The *General Summary* report will contain industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

### **Scope of Census and Definition of Manufacturing**

The 1987 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial*



*Classification (SIC) Manual*<sup>1</sup>. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

### **Relationship Between Annual Survey of Manufactures and Census of Manufactures**

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 56,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

### **Establishment Basis of Reporting**

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in

distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1987, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

### **Manufacturing Universe and Census Report Forms**

The 1987 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

#### **1. Small Single-Establishment Companies Not Sent a Report Form**

In the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than five employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

<sup>1</sup>Standard Industrial Classification Manual: 1987: For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 041-001-00314-2.



were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-record cases were only given a two- or three-digit SIC group. For the 1987 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

## 2. Establishments Sent a Report Form

The 200,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments**—This group consisted of approximately 56,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM)**—Approximately 84,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM)**—This group consisted of approximately 60,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested



summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

## Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1987 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

## Industry Classification of Establishments

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1987, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures).



However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all

carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

### **Value of Shipments for the Industry Compared With Value of Product Shipments**

This report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

### **CENSUS DISCLOSURE RULES**

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed. However, the suppressed data are included in higher-level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

### **SPECIAL TABULATIONS**

Special tabulations of data collected in the 1987 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential



information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, DC 20233.

## ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.

n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

## CONTACTS FOR DATA USERS

Subject Area	Contact	Phone
Census/ASM		
Durables	Kenneth Hansen	(301) 763-7304
Nondurables	Michael Zampogna	(301) 763-2510
Current Industrial Reports		
Durables	Malcolm Bernhardt	(301) 763-2518
Nondurables	Thomas Flood	(301) 763-5911
Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

# Users' Guide for Locating Statistics in This Report by Table Number

For explanation of terms, see appendixes

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies .....	1a			3a					*6a		
Number of establishments. ....	1a		2	3a	4	5a					
Employment and payroll: .....											
Number of employees .....	1a	1b	2	3a	4	5a					
Payroll .....	1a	1b	2	3a	4	5a					
Supplemental labor costs ...				3a							
Production workers .....	1a	1b	2	3a	4	5a					
Production- worker hours. ...	1a	1b	2	3a	4	5a					
Production- worker wages ...	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit) .....	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digits) .....									6a	6b	6c
Product shipments (seven-digit) .....									6a		
Value added by manufacture .....	1a	1b	2	3a	4	5a					
Cost of materials .....	1a	1b	2	3a	4	5a					
Fuels and electric energy ...				3a							
Materials consumed by kind .							7				
Inventories:											
Total, end of year .....	1a			3a	4						
By stage of fabrication .....				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures. ...	1a		2	3b	4	5a					
Used plant and equipment expenditures .....				3b							
Gross assets .....				3b							
Depreciation .....				3b							
Retirements of buildings and machinery .....				3b							
Rental payments .....				3b							
Foreign content of materials consumed .....				3c							
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Coverage .....	1a			3a				5b			

\*Number of companies with shipments of more than \$100 thousand.

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# DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

This report shows 1987 Census of Manufactures statistics for establishments classified in each of the following industries:

## SIC code and title

3571	Electronic Computers
3572	Computer Storage Devices
3575	Computer Terminals
3577	Computer Peripheral Equipment, N.E.C.
3578	Calculating and Accounting Equipment
3579	Office Machines, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account when comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-establishment companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other Federal agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions included in the 1987 Standard Industrial Classification (SIC) Manual<sup>1</sup>. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The

product class and product code comparability between the 1987 and 1982 censuses is shown in the appendixes. These appendixes present, in tabular form, the linkage from 1987 to 1982.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

## INDUSTRY 3571, ELECTRONIC COMPUTERS

This industry is made up of establishments primarily engaged in manufacturing electronic computers. Electronic computers are machines which: (1) store the processing program or programs and the data immediately necessary for execution of the program; (2) can be freely programmed in accordance with the requirements of the user; (3) perform arithmetical computations specified by the user; and (4) execute, without human intervention, a processing program which requires them to modify their execution by logical decision during the processing run. Included in this industry are digital computers, analog computers, and hybrid digital/analog computers. Establishments primarily engaged in manufacturing machinery or equipment which incorporate computers or a central processing unit for the purpose of performing functions such as measuring, displaying, or controlling process variables are classified based on the manufactured end product. Products of this industry also are collected in the Current Industrial Report MA-35R, Computers and Office and Accounting Machines.

Industry 3571, Electronic Computers, was previously included in the statistics for Industry 3573, Electronic Computing Equipment, under the 1972 SIC. Also, 1972 SIC-based product code 36629 43, Computer Kits to be Assembled by Purchaser, is now classified in product class 35711. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3571, Electronic Computers, had employment of 151.9 thousand. The leading States in employment were California, Massachusetts, New York, and Minnesota.

The total value of shipments for establishments classified in this industry was \$33.6 billion.

<sup>1</sup>Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.



Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3571 shipped \$24.8 billion of electronic computers products considered primary to the industry, \$3.9 billion of secondary products, and had \$5.0 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 87 percent (specialization ratio).

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3571, no matter in what industry they were produced, appear in table 6a and aggregate to \$26.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electronic computers industry amounted to \$15.2 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 4 percent of total value of shipments.

## **INDUSTRY 3572, COMPUTER STORAGE DEVICES**

This industry is made up of establishments primarily engaged in manufacturing computer storage devices. Products of this industry also are collected in the Current Industrial Report MA-35R, Computers and Office and Accounting Machines.

Industry 3572, Computer Storage Devices, was previously included in the statistics for Industry 3573, Electronic Computing Equipment, under the 1972 SIC. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3572, Computer Storage Devices, had employment of 43.3 thousand. The leading States in employment were California, Colorado, Minnesota, and Oklahoma.

The total value of shipments for establishments classified in this industry was \$6.4 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3572 shipped \$5.3 billion of computer storage devices products considered primary to the industry, \$277.3 million of secondary products, and had \$781.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 95 percent (specialization ratio).

Establishments in this industry also accounted for 77 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3572, no matter in what industry they were produced, appear in table 6a and aggregate to \$6.9 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the computer storage devices industry amounted to \$3.3 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 2 percent of total value of shipments.

## **INDUSTRY 3575, COMPUTER TERMINALS**

This industry is made up of establishments primarily engaged in manufacturing computer terminals. Establishments primarily engaged in manufacturing point-of-sale, funds transfer, and automatic teller machines are classified in industry 3578. Products of this industry also are collected in the Current Industrial Report MA-35R, Computers and Office and Accounting Machines.

Industry 3575, Computer Terminals, was previously included in the statistics for Industry 3573, Electronic Computing Equipment, under the 1972 SIC. Also, 1972 SIC-based product 36612 10, Alphanumeric Display Terminals, Including Teleprinters, is now classified in product class 35751. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3575, Computer Terminals, had employment of 15.0 thousand. The leading States in employment were California, Minnesota, Oregon, and Arkansas.



The total value of shipments for establishments classified in this industry was \$1.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3575 shipped \$1.4 billion of computer terminal products considered primary to the industry, \$170.4 million of secondary products, and had \$198.9 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 89 percent (specialization ratio).

Establishments in this industry also accounted for 52 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3575, no matter in what industry they were produced, appear in table 6a and aggregate to \$2.7 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the computer terminals industry amounted to \$742.0 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 9 percent of total value of shipments.

## **INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.**

This industry is made up of establishments primarily engaged in manufacturing computer peripheral equipment, not elsewhere classified, including printers, plotters, and graphic displays. Establishments primarily engaged in manufacturing modems and other communications interface equipment are classified in industry 3661. Products of this industry also are collected in the Current Industrial Report MA-35R, Computer and Office and Accounting Machines.

Industry 3577, Computer Peripheral Equipment, N.E.C., was previously included in the statistics for Industry 3573, Electronic Computing Equipment, under the 1972 SIC. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3577, Computer Peripheral Equipment, N.E.C., had employment

of 76.2 thousand. The leading States in employment in 1987 were California, Minnesota, North Carolina, and Arizona.

The total value of shipments of for establishments classified in this industry was \$14.0 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3577 shipped \$10.4 billion of computer peripheral equipment, n.e.c., products considered primary to the industry, \$2.5 billion of secondary products, and had \$1.0 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 81 percent (specialization ratio).

Establishments in this industry also accounted for 83 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3577, no matter in what industry they were produced, appear in table 6a and aggregate to \$12.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the computer peripheral equipment, n.e.c., industry amounted to \$7.1 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of total value of shipments.

## **INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT**

This industry is made up of establishments primarily engaged in manufacturing point-of-sale devices, fund transfer devices, and other calculating and accounting machines, except electronic computers. Included are electronic calculating and accounting machines which must be paced by operator intervention, even when augmented by attachments. These machines may include program control or have input/output capabilities. Products of this industry also are collected in the Current Industrial Report MA-35R, Computer and Office and Accounting Machines.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. However, the industry SIC number has been changed from 3574 to 3578.

In the 1987 Census of Manufactures, Industry 3578, Calculating and Accounting Equipment, had employment of 12.8 thousand. The employment figure was 17 percent



below the 15.4 thousand reported in 1982. The leading States in employment in 1987 were Ohio, California, Washington, and Oregon. This represents a shift from 1982 when Oregon, Ohio, California, and Texas were the leaders.

The total value of shipments for establishments classified in this industry was \$1.5 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3578 shipped \$1.1 billion of calculating and accounting equipment products considered primary to the industry, \$248.1 million of secondary products, and had \$133.0 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 82 percent (specialization ratio). In 1982, the specialization ratio was 74 percent.

Establishments in this industry also accounted for 91 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 77 percent. The products primary to industry 3578, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.2 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the calculating and accounting equipment industry amounted to \$560.6 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 9 percent of total value of shipments.

### **INDUSTRY 3579, OFFICE MACHINES, N.E.C.**

This industry is made up of establishments primarily engaged in manufacturing office machines and devices, not elsewhere classified, including typewriters and word processing equipment. Establishments primarily engaged in manufacturing photocopy and microfilm equipment are classified in industry 3861. Products of this industry also are collected in the Current Industrial Report MA-35R, Computers and Office and Accounting Machines.

The 1987 definition of this industry has been revised from that used in the 1972 Standard Industrial Classification (SIC) manual. However, the SIC number and title are unchanged. Industry 3579, Office Machines, N.E.C., is a combination of 1972 SIC-based industries 3572, Typewriters, and 3579, Office Machines, N.E.C.

In the 1987 Census of Manufactures, Industry 3579, Office Machines, N.E.C., had employment of 28.5 thousand. The employment figure was 35 percent below the 43.7 thousand reported in 1982. Compared with 1986, employment decreased 21 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Connecticut, Illinois, California, and New York. This represents a shift from 1982 when Kentucky, Illinois, New York, and Connecticut were the leaders.

The total value of shipments for establishments classified in this industry was \$3.3 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3579 shipped \$2.2 billion of office machines, n.e.c., products considered primary to the industry, \$245.4 million of secondary products, and had \$811.7 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 90 percent (specialization ratio). In 1982, the specialization ratio was 81 percent.

Establishments in this industry also accounted for 69 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 87 percent. The products primary to industry 3579, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.3 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the office machines, n.e.c., industry amounted to \$1.4 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments.



**Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years**

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year <sup>1</sup>	Companies <sup>2</sup> (no.)	All establishments <sup>3</sup>		All employees		Production workers			Value added by manufac- ture <sup>4</sup> (million dollars)	Cost of materials <sup>5</sup> (million dollars)	Value of shipments (million dollars)	New capital expendi- tures <sup>6</sup> (million dollars)	End-of- year inventories <sup>4</sup> (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spe- cial- ization <sup>7</sup> (per- cent)	Cover- age <sup>8</sup> (per- cent)
INDUSTRY 3571, ELECTRONIC COMPUTERS <sup>9</sup>															
1987 Census ---	938	974	394	151.9	4 953.0	54.7	105.8	1 126.2	18 322.2	15 222.9	33 626.5	1 223.3	5 120.0	87	93
INDUSTRY 3572, COMPUTER STORAGE DEVICES <sup>9</sup>															
1987 Census ---	100	106	64	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	1 004.4	95	77
INDUSTRY 3575, COMPUTER TERMINALS <sup>9</sup>															
1987 Census ---	122	121	74	15.0	441.7	5.5	10.7	124.1	1 014.3	742.0	1 799.0	58.0	298.9	89	52
INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C. <sup>9</sup>															
1987 Census ---	520	549	252	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	2 314.7	81	83
INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT <sup>10</sup>															
1987 Census ---	93	98	53	12.8	380.7	6.0	12.4	142.7	937.3	560.6	1 486.8	40.2	288.5	82	91
1986 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	5.1	199.7	2.2	6.2	77.1	606.3	416.0	1 026.4	19.7	157.2	(NA)	(NA)
1985 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	5.5	195.5	2.2	6.3	68.5	485.7	403.7	945.9	25.5	185.2	(NA)	(NA)
1984 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	9.1	250.1	3.9	10.0	68.3	695.5	507.5	1 188.9	64.6	258.4	(NA)	(NA)
1983 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	13.7	302.4	6.8	13.5	108.0	627.8	686.2	1 302.9	48.3	264.8	(NA)	(NA)
1982 Census ---	65	70	42	15.4	292.2	7.2	13.9	107.8	815.0	676.5	1 487.3	52.7	320.6	74	77
1981 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	15.5	297.9	6.8	12.9	79.7	689.7	670.0	1 384.6	64.2	275.9	(NA)	(NA)
1980 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	19.1	331.5	8.0	16.5	111.0	763.6	793.6	1 518.2	61.0	395.6	(NA)	(NA)
1979 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	18.7	260.2	9.2	19.1	99.8	710.1	621.1	1 302.2	68.6	325.7	(NA)	(NA)
1978 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	18.6	241.9	10.6	19.2	101.6	485.7	585.6	1 063.5	61.4	247.0	(NA)	(NA)
1977 Census ---	60	64	31	17.1	220.7	10.4	18.1	92.9	394.8	450.5	850.0	56.3	218.2	84	77
1976 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	19.7	243.1	10.7	21.9	107.4	409.7	491.5	960.8	31.6	280.1	(NA)	(NA)
1975 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	20.1	222.6	12.2	24.2	112.4	368.8	424.8	853.8	28.7	264.2	(NA)	(NA)
1974 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	24.7	257.6	16.5	32.2	154.6	460.0	491.1	891.0	28.8	348.9	(NA)	(NA)
1973 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	23.1	222.9	16.8	33.1	147.2	469.0	352.0	802.4	24.6	266.4	(NA)	(NA)
1972 Census ---	74	79	30	22.5	207.2	17.9	33.4	152.5	407.0	256.7	637.1	19.0	216.7	97	86
INDUSTRY 3579, OFFICE MACHINES, N.E.C.															
1987 Census ---	191	204	102	28.5	824.8	13.5	26.3	270.8	1 869.8	1 448.4	3 297.2	125.1	829.4	90	69
1986 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	35.9	1 018.3	15.8	30.1	322.0	2 652.0	1 906.8	4 630.9	164.9	1 104.1	(NA)	(NA)
1985 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	38.8	1 091.9	16.5	31.7	331.0	3 147.9	2 347.5	5 383.5	256.6	1 226.8	(NA)	(NA)
1984 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	38.7	1 037.7	17.2	34.2	351.2	2 382.5	2 193.7	4 449.5	281.0	1 104.2	(NA)	(NA)
1983 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	45.9	1 060.0	24.2	46.7	442.3	2 641.6	1 691.9	4 346.3	206.7	1 035.6	(NA)	(NA)
1982 Census ---	203	232	125	43.7	963.7	21.2	40.1	359.5	2 689.3	1 572.7	4 256.7	198.5	1 089.1	81	87
1981 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	44.6	877.2	23.7	45.2	367.0	2 460.8	1 509.8	3 955.5	149.3	957.7	(NA)	(NA)
1980 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	50.5	989.9	24.7	48.5	362.5	2 335.1	1 587.6	3 803.9	221.4	1 054.3	(NA)	(NA)
1979 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	47.1	834.4	25.3	51.1	335.4	2 131.8	1 339.3	3 356.7	177.7	858.3	(NA)	(NA)
1978 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	46.1	723.6	24.8	47.6	344.5	1 935.3	1 185.9	3 002.8	193.8	696.8	(NA)	(NA)
1977 Census ---	195	215	98	42.4	638.8	22.9	43.7	266.0	1 691.3	1 077.1	2 719.7	111.5	575.3	76	91
1976 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	36.7	495.6	20.4	36.9	211.6	1 340.7	664.6	2 006.3	70.1	433.2	(NA)	(NA)
1975 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	35.4	440.5	19.5	35.1	186.1	1 179.2	609.2	1 791.4	59.0	432.6	(NA)	(NA)
1974 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	38.1	448.0	22.5	42.9	201.4	1 290.3	650.1	1 874.3	46.4	430.4	(NA)	(NA)
1973 ASM <sup>11</sup> -----	(NA)	(NA)	(NA)	35.7	394.5	21.7	42.9	186.9	1 058.1	549.6	1 582.0	45.1	318.3	(NA)	(NA)
1972 Census ---	206	217	97	34.5	342.5	20.8	41.1	168.8	870.1	414.6	1 296.2	49.6	245.4	79	87

<sup>1</sup>In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the industry chapter.

<sup>2</sup>For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>3</sup>Includes establishments with payroll at any time during year.

<sup>4</sup>Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

<sup>5</sup>Detailed data on materials consumed by type are shown in table 7.

<sup>6</sup>Detailed data on new machinery and equipment expenditures are provided in table 3c.

<sup>7</sup>Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

<sup>8</sup>Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

<sup>9</sup>Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classifications revision appears in the Summary of Findings of this report.

<sup>10</sup>Although there was no change in definition or content, Industry 3574, Calculating and Accounting Machines, was renumbered to industry 3578.

<sup>11</sup>Data either have associated standard errors exceeding 15 percent or are not consistent with other census series and related data; thus these estimates may be of limited reliability.

**Table 1a-2. Historical Statistics for the Industry (1972 Basis): 1987 and Earlier Years**

[Table 1a-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Companies (no.)	All establishments		All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year invento- ries (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Spe- cial- ization (per- cent)	Cover age (per- cent)
INDUSTRY 3573, ELECTRONIC COMPUTING EQUIPMENT															
1987 Census ---	1 736	1 852	871	310.7	10 119.4	115.0	234.0	2 436.7	31 287.3	28 022.8	59 195.4	2 180.2	9 359.8	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	315.0	10 050.7	114.2	225.6	2 418.4	24 303.3	27 350.1	52 568.8	2 209.7	8 984.2	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	355.5	10 668.9	133.4	262.0	2 726.0	23 418.1	30 834.4	55 314.7	3 139.7	10 320.1	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	373.7	10 471.3	157.7	309.6	3 025.6	25 868.3	29 378.7	53 524.4	3 036.6	11 718.9	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	354.4	9 130.2	150.1	298.2	2 694.7	20 877.9	21 417.8	41 977.0	2 340.5	9 085.4	(NA)	(NA)
1982 Census ---	1 520	1 739	843	337.9	8 052.7	140.9	274.5	2 352.0	19 597.8	17 480.5	36 767.1	2 381.3	8 445.6	95	94
1981 ASM -----	(NA)	(NA)	(NA)	320.7	6 950.5	136.0	263.0	2 116.2	17 745.7	14 774.1	32 031.8	2 124.9	7 863.4	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	304.6	5 915.5	134.7	268.7	1 875.2	14 716.9	12 787.0	26 593.7	1 737.9	6 878.9	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	273.9	4 776.8	122.0	243.8	1 545.9	12 465.2	9 985.0	21 466.3	1 316.8	5 523.9	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	232.1	3 813.9	102.9	202.3	1 267.2	9 627.8	7 519.1	16 557.6	1 101.0	3 988.9	(NA)	(NA)
1977 Census ---	802	931	434	192.6	3 003.9	85.5	172.3	978.1	7 622.5	5 700.5	12 921.8	651.4	3 007.7	94	91
1976 ASM -----	(NA)	(NA)	(NA)	165.7	2 451.3	71.3	144.0	707.0	6 108.1	4 379.9	10 387.6	373.1	2 293.8	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	162.5	2 292.1	73.8	145.9	731.1	4 690.0	3 705.0	8 559.5	292.3	2 264.4	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	176.7	2 222.2	86.8	173.0	795.1	5 205.0	4 164.2	9 121.5	296.0	2 477.9	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	155.3	1 872.8	74.9	151.4	659.5	4 238.1	3 480.5	7 422.7	207.3	2 004.7	(NA)	(NA)
1972 Census ---	518	601	354	144.8	1 668.3	64.7	130.6	546.8	3 497.6	2 980.7	6 471.2	212.8	1 574.1	92	91

Note: For qualifications of data, see footnotes on table 1a-1.

**Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years**

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
<b>INDUSTRY 3571, ELECTRONIC COMPUTERS</b>									
1987 Census	32 607	36	1 934	10.64	45	60	120 620	27	173.18
<b>INDUSTRY 3572, COMPUTER STORAGE DEVICES</b>									
1987 Census	33 316	35	2 067	10.58	51	73	75 485	44	105.44
<b>INDUSTRY 3575, COMPUTER TERMINALS</b>									
1987 Census	29 447	37	1 945	11.60	41	66	67 620	44	94.79
<b>INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>									
1987 Census	34 454	34	2 240	9.87	51	70	90 789	38	117.86
<b>INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT</b>									
1987 Census	29 742	47	2 067	11.51	38	63	73 227	41	75.59
1986 ASM <sup>11</sup>	39 156	43	2 818	12.44	41	60	118 882	33	97.79
1985 ASM <sup>11</sup>	35 545	40	2 864	10.87	43	63	88 309	40	77.10
1984 ASM <sup>11</sup>	27 483	43	2 564	6.83	43	64	76 429	36	69.55
1983 ASM	22 072	50	1 985	8.00	53	76	45 825	48	46.50
1982 Census	18 974	47	1 931	7.76	45	65	52 922	36	58.63
1981 ASM	19 219	44	1 897	6.18	48	70	44 497	43	53.47
1980 ASM	17 356	42	2 063	6.73	52	74	39 979	43	46.28
1979 ASM	13 914	49	2 076	5.23	48	68	37 973	37	37.18
1978 ASM	13 005	57	1 811	5.29	55	78	26 113	50	25.30
1977 Census	12 906	61	1 740	5.13	53	79	23 088	56	21.81
1976 ASM	12 340	54	2 047	4.90	51	76	20 797	59	18.71
1975 ASM	11 074	61	1 984	4.64	50	76	18 348	60	15.24
1974 ASM	10 429	67	1 952	4.80	55	84	18 623	56	14.29
1973 ASM	9 649	73	1 970	4.45	44	72	20 303	48	14.17
1972 Census	9 208	80	1 866	4.57	40	73	18 089	51	12.19
<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.</b>									
1987 Census	28 940	47	1 948	10.30	44	69	65 607	44	71.10
1986 ASM	28 364	44	1 905	10.70	41	63	73 872	38	88.11
1985 ASM	28 141	43	1 921	10.44	44	64	81 131	35	99.30
1984 ASM	26 813	44	1 988	10.27	49	73	61 563	44	69.66
1983 ASM	23 093	53	1 930	9.47	39	63	57 551	40	56.57
1982 Census	22 052	49	1 892	8.97	37	60	61 540	36	67.06
1981 ASM	19 668	53	1 907	8.12	38	60	55 175	36	54.44
1980 ASM	19 601	49	1 964	7.47	42	68	46 240	42	48.15
1979 ASM	17 715	54	2 020	6.56	40	65	45 261	39	41.72
1978 ASM	15 696	54	1 919	7.24	39	64	41 980	37	40.66

See footnotes at end of table.



**Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years**  
—Con.

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.—Con.</b>									
1977 Census.....	15 066	54	1 908	6.09	40	63	39 889	38	38.70
1976 ASM.....	13 504	56	1 809	5.73	33	58	36 531	37	36.33
1975 ASM.....	12 443	55	1 800	5.30	34	59	33 311	37	33.60
1974 ASM.....	11 758	59	1 907	4.69	35	59	33 866	35	30.08
1973 ASM.....	11 050	61	1 977	4.36	35	60	29 639	37	24.66
1972 Census.....	9 927	60	1 976	4.11	32	58	25 220	39	21.17

Note: For qualifications of data, see footnotes on table 1a-1.

**Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years**

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
<b>INDUSTRY 3573, ELECTRONIC COMPUTING EQUIPMENT</b>									
1987 Census.....	32 570	37	2 035	10.41	47	64	100 699	32	133.71
1986 ASM.....	31 906	36	1 975	10.72	52	71	77 153	41	107.73
1985 ASM.....	30 010	38	1 964	10.40	56	75	65 874	46	89.38
1984 ASM.....	28 020	42	1 963	9.77	55	74	69 222	40	83.55
1983 ASM.....	25 762	42	1 987	9.04	51	73	58 911	44	70.01
1982 Census.....	23 831	42	1 948	8.57	48	69	57 999	41	71.39
1981 ASM.....	21 672	42	1 934	8.05	46	68	55 334	39	67.47
1980 ASM.....	19 420	44	1 995	6.98	48	70	48 315	40	54.77
1979 ASM.....	17 439	45	1 998	6.34	47	69	45 510	38	51.13
1978 ASM.....	16 432	44	1 966	6.26	45	68	41 481	40	47.59
1977 Census.....	15 596	44	2 015	5.68	44	67	39 577	39	44.24
1976 ASM.....	14 793	43	2 020	4.91	42	66	36 862	40	42.42
1975 ASM.....	14 105	45	1 977	5.01	43	70	28 862	49	32.15
1974 ASM.....	12 576	49	1 993	4.60	46	70	29 457	49	30.09
1973 ASM.....	12 059	48	2 021	4.36	47	72	27 290	44	27.99
1972 Census.....	11 521	45	2 019	4.19	46	72	24 155	48	26.78

Note: For qualifications of data, see footnotes on table 1a-1.

**Table 1c-1. 1987 Statistics for the Industry Showing the Distribution of 1987 SIC-Based Industries Among 1972 SIC-Based Industries**

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
New Industry 3571, Electronic Computers.....	974	151.9	4 953.0	54.7	105.8	1 126.2	18 322.2	15 222.9	33 626.5	1 223.3	5 120.0
Old Industry 3573, Electronic Computing Equipment.....	969	151.5	4 945.2	54.4	105.4	1 122.8	18 304.9	15 206.0	33 591.9	1 222.9	5 111.2
Old Industry 3662, Radio and Television Communication Equipment.....	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
All other.....	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Industry 3572, Computer Storage Devices.....	106	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	1 004.4
Old Industry 3573, Electronic Computing Equipment.....	106	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	1 004.4
New Industry 3575, Computer Terminals.....	121	15.0	441.7	5.5	10.7	124.1	1 014.3	742.0	1 799.0	58.0	298.9
Old Industry 3573, Electronic Computing Equipment.....	115	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Old Industry 3661, Telephone and Telegraph Apparatus.....	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Industry 3577, Computer Peripheral Equipment, N.E.C.....	549	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	2 314.7
Old Industry 3573, Electronic Computing Equipment.....	549	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	2 314.7

Note: For qualifications of data, see footnotes on table 1a-1.

**Table 1c-2. 1987 Statistics for the Industry Showing the Distribution of 1972 SIC-Based Industries Among 1987 SIC-Based Industries**

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
Old Industry 3573, Electronic Computing Equipment ..	1 852	310.7	10 119.4	115.0	234.0	2 436.7	31 287.3	28 022.8	59 195.4	2 180.2	9 359.8
New Industry 3571, Electronic Computers.....	969	151.5	4 945.2	54.4	105.4	1 122.8	18 304.9	15 206.0	33 591.9	1 222.9	5 111.2
New Industry 3572, Computer Storage Devices.....	106	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	1 004.4
New Industry 3575, Computer Terminals.....	115	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Industry 3577, Computer Peripheral Equipment, N.E.C. ....	549	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	2 314.7
New Industry 3661, Telephone and Telegraph Apparatus .....	39	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Industry 3695, Magnetic and Optical Recording Media .....	67	15.5	401.4	8.8	18.3	167.0	903.1	880.8	1 755.4	111.1	274.1
All other.....	7	2.1	61.0	1.2	2.2	24.9	135.3	105.0	240.2	5.8	36.9

Note: For qualifications of data, see footnotes on table 1a-1.

**Table 2. Industry Statistics for Selected States: 1987 and 1982**

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area		1987										1982		
		All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees <sup>2</sup> (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number <sup>2</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
E <sup>1</sup>														
INDUSTRY 3571, ELECTRONIC COMPUTERS														
United States .....	-	974	394	151.9	4 953.0	54.7	105.8	1 126.2	18 322.2	15 222.9	33 626.5	1 223.3	(NA)	(NA)
Alabama .....	-	9	2	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arizona .....	-	23	9	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California .....	-	334	150	45.6	1 555.2	14.1	26.1	308.7	5 154.3	3 596.6	8 705.2	473.0	(NA)	(NA)
Colorado .....	-	18	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Connecticut.....	E3	17	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Florida .....	-	32	13	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Georgia .....	E3	17	9	.8	18.0	.3	.6	4.9	41.8	57.3	92.9	1.6	(NA)	(NA)
Illinois .....	E4	19	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Iowa .....	-	4	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts.....	-	71	42	23.5	697.7	10.7	21.1	185.7	3 738.9	2 184.7	5 960.6	(D)	(NA)	(NA)
Michigan .....	-	23	11	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota .....	-	36	23	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri .....	E1	6	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire.....	-	22	11	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey .....	E2	36	11	2.2	61.6	1.2	2.6	27.0	149.6	87.2	241.3	9.6	(NA)	(NA)
New Mexico .....	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York .....	-	43	14	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
North Carolina .....	E2	16	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio .....	E5	19	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon .....	-	17	6	1.4	49.3	.5	1.0	10.8	76.7	55.8	132.0	9.9	(NA)	(NA)
Pennsylvania .....	-	23	8	2.8	83.7	.8	1.4	13.5	165.7	352.2	498.5	(D)	(NA)	(NA)
South Carolina .....	-	7	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Tennessee .....	-	8	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas .....	-	63	24	10.0	283.7	4.2	7.9	79.0	884.5	1 078.3	1 923.0	70.1	(NA)	(NA)
Utah .....	E6	15	2	.2	4.7	.1	.1	1.2	9.0	6.7	15.7	(D)	(NA)	(NA)
Vermont.....	-	5	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Virginia .....	E1	14	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington.....	E4	22	3	.3	7.8	.1	.2	1.6	15.3	12.1	27.5	(D)	(NA)	(NA)
Wisconsin .....	-	9	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3572, COMPUTER STORAGE DEVICES														
United States .....	-	106	64	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	(NA)	(NA)
California .....	-	48	32	20.8	855.1	5.2	11.3	126.8	1 395.7	1 408.6	2 742.1	201.3	(NA)	(NA)
Colorado .....	-	9	8	10.3	242.4	3.0	6.8	54.5	540.3	740.5	1 258.3	68.6	(NA)	(NA)
Idaho .....	-	1	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kansas .....	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maine .....	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota .....	-	11	8	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey.....	E9	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio .....	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oklahoma .....	-	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon .....	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania .....	-	3	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas .....	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Utah .....	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.



**Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.**

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees <sup>2</sup> (1,000)	Value added by manufacture (million dollars)	
	E <sup>1</sup>	Total (no.)	With 20 employees or more (no.)	Number <sup>2</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)							Wages (million dollars)
INDUSTRY 3575, COMPUTER TERMINALS														
United States .....	-	121	74	15.0	441.7	5.5	10.7	124.1	1 014.3	742.0	1 799.0	58.0	(NA)	(NA)
Arizona .....	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas .....	-	1	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California .....	-	37	22	2.4	76.2	1.0	1.9	19.6	251.7	154.8	404.8	11.0	(NA)	(NA)
Colorado .....	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Florida .....	E9	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Georgia .....	E3	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Illinois .....	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts .....	E2	12	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota .....	-	3	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri .....	E2	5	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire .....	E2	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey .....	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York .....	E1	10	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon .....	-	4	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania .....	-	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas .....	-	4	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Utah .....	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.														
United States .....	-	549	252	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	(NA)	(NA)
Alabama .....	-	4	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arizona .....	-	10	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California .....	E1	185	92	17.9	594.1	6.7	13.5	160.2	2 323.0	1 472.3	3 772.8	63.8	(NA)	(NA)
Colorado .....	E2	12	2	.2	3.4	.1	.2	1.3	6.5	7.7	15.0	.8	(NA)	(NA)
Connecticut .....	E3	14	11	1.8	50.9	.7	1.7	15.0	87.2	67.3	155.2	(D)	(NA)	(NA)
Florida .....	-	13	10	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Idaho .....	-	3	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Illinois .....	-	12	6	.5	12.1	.2	.4	3.5	29.7	22.5	52.2	(D)	(NA)	(NA)
Kentucky .....	-	3	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland .....	-	7	4	.7	15.3	.3	1.2	6.7	47.6	18.3	65.5	(D)	(NA)	(NA)
Massachusetts .....	E2	42	24	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan .....	E2	11	5	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota .....	-	14	12	9.8	403.1	2.0	9.6	50.5	1 021.0	479.5	1 499.9	44.5	(NA)	(NA)
Missouri .....	E1	7	1	.4	8.0	.2	.4	4.0	11.2	17.1	28.1	.8	(NA)	(NA)
Nevada .....	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire .....	-	8	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey .....	-	10	3	1.1	20.9	.4	.7	6.2	45.0	134.3	182.1	3.5	(NA)	(NA)
New York .....	E1	29	10	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
North Carolina .....	-	14	5	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oklahoma .....	-	3	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon .....	E1	7	2	.3	5.5	.2	.4	2.5	20.9	44.8	64.6	(D)	(NA)	(NA)
Pennsylvania .....	-	20	7	2.1	41.6	.3	.6	6.3	168.8	94.9	259.3	7.4	(NA)	(NA)
South Dakota .....	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas .....	-	32	14	3.0	119.5	.5	1.0	7.6	212.7	113.1	326.1	9.5	(NA)	(NA)
Utah .....	-	12	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Virginia .....	-	9	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington .....	-	22	12	3.2	65.7	2.1	3.9	29.4	176.5	113.8	284.2	11.5	(NA)	(NA)
Wyoming .....	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT														
United States .....	-	98	53	12.8	380.7	6.0	12.4	142.7	937.3	560.6	1 486.8	40.2	15.4	815.0
California .....	E1	18	11	2.3	91.5	1.2	2.7	48.9	213.6	45.4	248.7	6.0	2.3	125.1
Connecticut .....	E9	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Illinois .....	E4	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Maryland .....	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts .....	E2	7	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Michigan .....	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri .....	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire .....	E9	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey .....	E3	7	4	.4	10.5	.2	.3	3.7	17.6	12.3	31.2	.8	(NA)	(NA)
New York .....	-	4	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio .....	-	6	5	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Oregon .....	-	3	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Pennsylvania .....	E2	6	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	41.0
Rhode Island .....	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington .....	-	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Wisconsin .....	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)

See footnotes at end of table.

**Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.**

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	E <sup>1</sup>	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees <sup>2</sup> (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number <sup>2</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.</b>														
United States -----	-	204	102	28.5	824.8	13.5	26.3	270.8	1 869.8	1 448.4	3 297.2	125.1	43.7	2 689.3
California -----	-	30	16	3.5	112.2	1.3	2.5	27.6	88.7	299.9	419.7	12.1	3.7	155.9
Colorado -----	-	3	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Connecticut -----	-	8	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Florida -----	-	6	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Georgia -----	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Illinois -----	-	29	21	4.8	117.7	2.1	4.1	41.9	420.3	252.1	664.4	(D)	5.8	259.8
Kentucky -----	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Massachusetts -----	-	10	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Minnesota -----	-	9	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
New Hampshire -----	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Jersey -----	E2	14	7	1.3	37.7	.4	.7	6.0	60.3	58.5	118.0	4.3	2.6	110.3
New York -----	-	20	10	3.5	73.1	2.5	5.5	48.2	210.0	186.8	381.9	(D)	FF	(D)
North Carolina -----	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Ohio -----	-	8	3	.6	13.0	.4	.7	6.3	27.5	16.2	43.8	(D)	EE	(D)
Oklahoma -----	-	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania -----	-	4	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Texas -----	-	7	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Wisconsin -----	-	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)

Note: For qualifications of data, see footnotes on table 1a-1.

<sup>1</sup>Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

<sup>2</sup>Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

**Table 3a. Summary Statistics for the Industry: 1987**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electronic computers (SIC 3571)	Computer storage devices (SIC 3572)	Computer terminals (SIC 3575)	Computer peripheral equipment, n.e.c. (SIC 3577)	Calculating and accounting equipment (SIC 3578)	Office machines, n.e.c. (SIC 3579)
Companies .....	938	100	122	520	93	191
All establishments .....	974	106	121	549	98	204
With 1 to 19 employees .....	580	42	47	297	45	102
With 20 to 99 employees .....	225	23	42	146	25	60
With 100 employees or more .....	169	41	32	106	28	42
Employment and labor costs:						
Employees .....	151.9	43.3	15.0	76.2	12.8	28.5
Compensation, total .....	5 938.4	1 699.1	526.8	3 077.8	452.5	990.3
Annual payroll .....	4 953.0	1 442.6	441.7	2 625.4	380.7	824.8
Fringe benefits .....	985.4	256.5	85.1	452.5	71.7	165.5
Social Security and other legally required payments .....	387.3	108.2	35.2	204.1	32.7	73.4
Employer payments and other programs .....	598.1	148.3	49.9	248.4	39.1	92.1
Production workers:						
Average for year .....	54.7	15.0	5.5	26.2	6.0	13.5
March .....	54.1	14.4	5.7	25.5	6.0	13.6
May .....	53.7	14.5	5.5	25.9	5.9	13.1
August .....	55.1	15.5	5.3	26.4	6.1	13.6
November .....	55.6	15.6	5.5	26.8	5.9	13.4
Hours .....	105.8	31.0	10.7	58.7	12.4	26.3
January to March .....	26.4	7.5	2.8	14.3	3.0	6.3
April to June .....	25.9	7.4	2.7	14.7	3.1	6.5
July to September .....	26.5	7.9	2.6	14.5	3.2	6.5
October to December .....	27.0	8.2	2.7	15.2	3.2	7.0
Wages .....	1 126.2	328.1	124.1	579.5	142.7	270.8
Value added by manufacture .....	18 322.2	3 268.5	1 014.3	6 918.1	937.3	1 869.8
Cost of materials <sup>1</sup> .....	15 222.9	3 252.8	742.0	7 107.3	560.6	1 448.4
Materials, parts, containers, etc., consumed <sup>2</sup> .....	12 204.6	2 778.0	652.9	6 290.9	516.1	1 072.0
Resales .....	2 619.8	339.4	63.4	334.6	25.5	334.6
Fuels .....	23.7	6.3	1.4	8.6	2.7	6.0
Purchased electricity .....	150.4	53.8	10.9	75.2	9.3	21.2
Contract work .....	224.4	75.3	13.5	397.9	7.0	14.6
Quantity of electric energy used for heat and power:						
Purchased .....	3 017.4	994.2	192.5	1 407.1	190.6	332.5
Generated less sold .....	(D)	-	-	(D)	-	-

See footnotes at end of table.



**Table 3a. Summary Statistics for the Industry: 1987—Con.**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electronic computers (SIC 3571)	Computer storage devices (SIC 3572)	Computer terminals (SIC 3575)	Computer peripheral equipment, n.e.c. (SIC 3577)	Calculating and accounting equipment (SIC 3578)	Office machines, n.e.c. (SIC 3579)
Total value of shipments.....mil dol...	33 626.5	6 394.8	1 799.0	13 965.5	1 486.8	3 297.2
Primary products.....do...	24 780.3	5 335.7	1 429.8	10 419.9	1 105.7	2 240.1
Secondary products.....do...	3 858.3	277.3	170.4	2 501.8	246.1	245.4
Miscellaneous receipts, total.....do...	4 987.9	781.8	198.9	1 043.8	133.0	811.7
Value of resales.....do...	3 359.0	541.9	90.8	406.1	59.0	558.3
Contract receipts.....do...	41.3	5.2	(D)	75.4	3.5	11.9
Receipts for related services:						
Custom computer programming <sup>3</sup> .....do...	233.3	-	(D)	(D)	(D)	(D)
Packaged computer software <sup>3</sup> .....do...	49.0	(D)	(D)	29.5	(D)	(D)
Computer integrated system design <sup>3</sup> .....do...	63.4	-	-	-	-	-
Computer maintenance and repair <sup>3</sup> .....do...	624.2	(D)	36.8	382.6	(D)	(D)
Computer related service, N.E.C. <sup>3</sup> .....do...	261.0	(Z)	(D)	91.7	(D)	(D)
Sales of scrap and refuse.....do...	5.4	(Z)	1.5	(D)	.5	.3
Receipts for research and development work.....do...	6.5	6.2	(D)	9.0	(D)	(D)
Other miscellaneous receipts.....do...	207.0	(D)	3.0	26.7	(D)	151.1
Miscellaneous receipts, n.s.k.....do...	137.8	2.6	30.0	14.0	.2	3.6
Inventories by stage of fabrication:						
Beginning of 1987.....mil dol...	4 897.5	910.5	350.3	2 261.6	246.7	805.1
Finished goods.....do...	1 167.9	137.5	68.6	316.3	56.4	277.0
Work in process.....do...	2 513.3	428.7	162.0	1 377.8	106.1	261.5
Materials and supplies.....do...	1 216.4	344.3	119.6	567.6	84.2	266.6
End of 1987.....do...	5 120.0	1 004.4	298.9	2 314.7	288.5	829.4
Finished goods.....do...	1 237.5	135.7	74.4	352.2	64.6	310.4
Work in process.....do...	2 362.2	557.0	113.6	1 401.7	108.9	249.0
Materials and supplies.....do...	1 520.3	311.7	111.0	560.8	115.0	270.0
Primary product specialization ratio.....percent...	87	95	89	81	82	90
Coverage ratio.....do...	93	77	52	83	91	69

Note: For qualifications of data, see footnotes on table 1a-1.

<sup>1</sup>Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

<sup>2</sup>Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

<sup>3</sup>Services shown represent those performed by employees of manufacturing establishments. Establishments primarily engaged in providing these services are classified in Industry Group 737, Computer and Data Processing Services.

**Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1987**

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electronic computers (SIC 3571)	Computer storage devices (SIC 3572)	Computer terminals (SIC 3575)	Computer peripheral equipment, n.e.c. (SIC 3577)	Calculating and accounting equipment (SIC 3578)	Office machines, n.e.c. (SIC 3579)
Gross book value of depreciable assets:						
Total:						
Beginning of year.....	7 786.5	3 058.1	695.0	4 336.7	374.1	1 130.7
New capital expenditures <sup>1</sup> .....	1 223.3	347.0	58.0	391.2	40.2	125.1
Used capital expenditures.....	45.0	7.2	2.6	91.9	.7	12.1
Retirements.....	660.8	146.3	90.6	233.9	17.3	56.9
End of year.....	8 394.0	3 266.1	664.9	4 585.9	397.7	1 210.9
Buildings and other structures:						
Beginning of year.....	2 069.5	931.2	177.7	1 191.3	129.8	317.6
New capital expenditures.....	245.6	41.0	7.1	39.2	5.6	10.1
Used capital expenditures.....	8.4	1.8	1.1	23.7	.1	3.1
Retirements.....	70.5	7.2	3.5	15.9	3.2	5.3
End of year.....	2 252.9	966.7	182.4	1 238.4	132.3	325.5
Machinery and equipment:						
Beginning of year.....	5 717.0	2 126.9	517.4	3 145.4	244.3	813.1
New capital expenditures <sup>1</sup> .....	977.7	306.1	50.9	351.9	34.7	115.0
Used capital expenditures.....	36.7	5.5	1.4	68.2	.6	8.9
Retirements.....	590.3	139.1	87.1	218.0	14.1	51.7
End of year.....	6 141.1	2 299.3	482.6	3 347.5	265.4	885.4
Depreciation charges during 1987:						
Total.....	896.0	283.7	67.4	432.0	33.2	80.0
Buildings and other structures.....	115.4	41.3	6.7	48.9	5.6	12.0
Machinery and equipment.....	780.6	242.4	60.7	383.0	27.7	68.0
Rental payments:						
Total.....	357.1	89.0	24.3	123.7	18.2	64.4
Buildings and other structures.....	268.8	47.7	17.4	80.9	12.5	25.3
Machinery and equipment.....	88.3	41.3	7.0	42.9	5.7	39.2

Note: Retirements and depreciation data for establishments not included in the ASM sample were extrapolated from the historical ratio of retirements or depreciation to assets. These ratios were developed at the industry level.

<sup>1</sup>Data on new machinery and equipment expenditures by type are provided in table 3c.

**Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1987**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Electronic computers (SIC 3571)		Computer storage devices (SIC 3572)		Computer terminals (SIC 3575)	
	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)
Purchased services:						
Cost of purchased services for the repair of—						
Buildings and other structures	62.8	(X)	24.4	(X)	2.0	(X)
Response coverage ratio (percent) <sup>2</sup>	63.4	(X)	89.5	(X)	58.0	(X)
Machinery	55.4	(X)	13.3	(X)	2.9	(X)
Response coverage ratio (percent) <sup>2</sup>	63.7	(X)	69.8	(X)	58.8	(X)
Cost of purchased communication services	75.3	(X)	26.5	(X)	(S)	(X)
Response coverage ratio (percent) <sup>2</sup>	60.1	(X)	91.4	(X)	(S)	(X)
New machinery and equipment expenditures	977.7	(X)	306.1	(X)	50.9	(X)
Automobiles, trucks, etc., for highway use	71.6	14	40.4	31	4.8	6
Computers and peripheral data processing equipment	329.7	3	61.2	4	11.1	6
All other	576.4	4	204.5	7	35.0	3
Adjustment ratio <sup>3</sup>	1.3	(X)	1.3	(X)	1.2	(X)
Cost of materials, components, parts, etc., used	12 204.6	(X)	2 778.0	(X)	652.9	(X)
Materials purchased or transferred from foreign sources <sup>4</sup>	2 517.1	2	292.7	6	119.8	10
Materials purchased or transferred from domestic sources	9 687.5	1	2 485.3	1	533.2	3
Adjustment ratio <sup>3</sup>	1.6	(X)	1.5	(X)	1.6	(X)
Item	Computer peripheral equipment, n.e.c. (SIC 3577)		Calculating and accounting equipment (SIC 3578)		Office machines, n.e.c. (SIC 3579)	
	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)
Purchased services:						
Cost of purchased services for the repair of—						
Buildings and other structures	188.5	(X)	1.2	(X)	10.2	(X)
Response coverage ratio (percent) <sup>2</sup>	62.9	(X)	75.6	(X)	70.0	(X)
Machinery	33.2	(X)	4.1	(X)	9.9	(X)
Response coverage ratio (percent) <sup>2</sup>	64.3	(X)	78.8	(X)	67.6	(X)
Cost of purchased communication services	35.7	(X)	4.1	(X)	9.5	(X)
Response coverage ratio (percent) <sup>2</sup>	67.1	(X)	78.8	(X)	64.1	(X)
New machinery and equipment expenditures	351.9	(X)	34.7	(X)	115.0	(X)
Automobiles, trucks, etc., for highway use	6.4	79	1	23	11.5	4
Computers and peripheral data processing equipment	89.8	3	10.9	1	18.4	1
All other	255.7	3	23.6	1	85.1	1
Adjustment ratio <sup>3</sup>	1.4	(X)	1.2	(X)	1.2	(X)
Cost of materials, components, parts, etc., used	6 290.9	(X)	516.1	(X)	1 072.0	(X)
Materials purchased or transferred from foreign sources <sup>4</sup>	1 397.3	2	64.1	3	145.7	5
Materials purchased or transferred from domestic sources	4 893.6	1	452.0	1	926.3	1
Adjustment ratio <sup>3</sup>	1.5	(X)	1.3	(X)	1.3	(X)

<sup>1</sup>For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

<sup>2</sup>Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to total employment for all establishments classified in industry. (See appendixes for explanation of sample weight.)

<sup>3</sup>Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response to the inquiry. (See appendixes for further explanation.)

<sup>4</sup>Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

**Table 4. Industry Statistics by Employment Size of Establishment: 1987**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E <sup>1</sup>	All estab- lish- ments (no.)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year invento- ries (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
<b>INDUSTRY 3571, ELECTRONIC COMPUTERS</b>												
Total	-	974	151.9	4 953.0	54.7	105.8	1 126.2	18 322.2	15 222.9	33 626.5	1 223.3	5 120.0
Establishments with an average of—												
1 to 4 employees	E8	346	.6	15.5	.2	.5	4.5	34.7	42.8	77.8	1.9	11.6
5 to 9 employees	E8	130	.9	20.7	.3	.7	6.2	42.8	55.1	98.0	2.7	14.9
10 to 19 employees	E9	104	1.4	40.0	.6	1.1	11.9	82.6	94.2	176.4	5.1	28.0
20 to 49 employees	E7	142	4.6	119.9	2.0	3.9	37.9	252.2	261.5	517.9	15.4	80.8
50 to 99 employees	E5	83	5.9	160.3	2.4	4.5	44.9	673.1	384.0	1 049.2	20.5	151.5
100 to 249 employees	E4	75	11.0	333.7	4.8	9.7	90.6	985.0	675.6	1 650.7	52.4	280.2
250 to 499 employees	E2	24	8.2	223.0	3.5	6.5	59.8	459.1	662.2	1 157.1	72.2	310.8
500 to 999 employees	-	33	24.1	751.1	9.3	18.3	192.6	4 552.4	2 231.9	6 794.5	119.0	803.2
1,000 to 2,499 employees	-	28	42.6	1 299.8	16.7	30.5	351.4	5 418.4	3 382.0	8 806.4	299.7	1 313.7
2,500 employees or more	-	9	52.7	1 989.0	14.9	30.2	326.4	5 821.8	7 433.7	13 298.7	634.3	2 125.3
Covered by administrative records <sup>2</sup>	E9	417	2.5	53.5	1.0	2.0	15.8	111.2	150.5	261.7	6.7	40.6

See footnotes at end of table.



Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E <sup>1</sup>	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
<b>INDUSTRY 3572, COMPUTER STORAGE DEVICES</b>												
Total .....	-	106	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0	1 004.4
Establishments with an average of—												
1 to 4 employees .....	E9	9	(Z)	.2	(Z)	(Z)	.1	.4	.6	1.0	(Z)	.2
5 to 9 employees .....	E9	13	.1	2.0	(Z)	.1	.6	4.3	5.7	9.9	.2	1.5
10 to 19 employees .....	E7	20	.3	7.8	.1	.2	1.9	15.4	19.6	35.0	1.1	5.6
20 to 49 employees .....	-	7	.2	5.8	.1	.2	1.4	13.5	13.3	26.5	.7	3.4
50 to 99 employees .....	-	16	1.2	35.7	.6	1.2	10.7	79.7	84.0	163.8	9.1	22.3
100 to 249 employees .....	E1	12	1.9	57.9	.8	1.6	19.5	181.7	162.5	359.5	16.0	42.0
250 to 499 employees .....	-	10	3.5	98.4	1.4	2.7	26.2	171.0	317.5	485.6	15.7	109.7
500 to 999 employees .....	-	10	7.0	235.9	3.4	7.3	90.1	777.0	783.7	1 510.3	45.3	217.5
1,000 to 2,499 employees .....	-	7	29.2	998.8	8.5	17.7	177.7	2 025.4	1 865.9	3 803.2	258.9	602.1
2,500 employees or more .....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records <sup>2</sup> .....	E9	34	.3	7.3	.1	.2	2.0	14.0	18.9	32.9	.8	5.1
<b>INDUSTRY 3575, COMPUTER TERMINALS</b>												
Total .....	-	121	15.0	441.7	5.5	10.7	124.1	1 014.3	742.0	1 799.0	58.0	298.9
Establishments with an average of—												
1 to 4 employees .....	E9	18	(Z)	.8	(Z)	(Z)	.2	1.5	2.0	3.4	.1	.5
5 to 9 employees .....	E7	10	.1	1.5	(Z)	.1	.4	3.5	4.1	7.6	.2	1.0
10 to 19 employees .....	E8	19	.3	7.2	.1	.2	1.8	14.4	15.1	29.4	.7	4.6
20 to 49 employees .....	E2	29	.9	26.3	.4	.7	6.4	48.6	43.5	94.9	3.1	16.7
50 to 99 employees .....	E1	13	1.0	31.0	.3	.7	8.0	88.1	70.2	159.5	3.2	25.4
100 to 249 employees .....	E1	17	2.5	68.7	.9	1.9	15.1	223.8	135.3	358.5	7.6	59.6
250 to 499 employees .....	-	8	4.0	120.2	1.7	3.2	40.5	274.1	284.3	555.7	13.5	92.5
500 to 999 employees .....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees .....	-	5	6.3	186.1	2.1	4.0	51.8	360.3	187.5	589.9	29.4	98.6
Covered by administrative records <sup>2</sup> .....	E9	42	.3	7.9	.1	.3	2.3	15.9	21.6	37.5	1.0	5.8
<b>INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>												
Total .....	-	549	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2	2 314.7
Establishments with an average of—												
1 to 4 employees .....	E7	123	.3	5.8	.1	.2	1.7	18.6	18.8	37.4	1.5	5.0
5 to 9 employees .....	E8	85	.6	15.7	.2	.5	4.5	31.6	39.8	71.2	1.8	10.7
10 to 19 employees .....	E7	89	1.2	35.8	.5	1.0	9.8	71.2	77.6	147.8	4.0	27.8
20 to 49 employees .....	E2	85	2.7	79.7	1.1	2.1	21.0	186.2	139.2	306.8	8.2	79.9
50 to 99 employees .....	E1	61	4.1	128.1	1.7	3.6	37.4	283.0	236.6	516.7	14.4	87.6
100 to 249 employees .....	E2	52	7.9	236.0	3.3	7.1	62.8	576.5	455.3	1 029.5	40.3	195.9
250 to 499 employees .....	-	23	8.0	228.9	3.6	7.6	72.5	490.4	638.8	1 138.7	26.6	203.8
500 to 999 employees .....	-	14	9.7	259.4	4.6	8.9	83.0	1 260.5	919.1	2 158.9	51.8	293.4
1,000 to 2,499 employees .....	-	13	41.8	1 635.9	11.0	27.8	287.0	4 000.1	4 582.1	8 558.6	242.6	1 410.6
2,500 employees or more .....	-	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records <sup>2</sup> .....	E9	255	1.7	42.4	.7	1.4	11.9	87.4	117.7	205.1	5.3	31.9
<b>INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT</b>												
Total .....	-	98	12.8	380.7	6.0	12.4	142.7	937.3	560.6	1 488.8	40.2	288.5
Establishments with an average of—												
1 to 4 employees .....	-	18	.1	2.1	.1	.1	1.0	15.6	5.0	20.7	.2	2.2
5 to 9 employees .....	E8	12	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
10 to 19 employees .....	E5	15	.2	7.4	.1	.2	2.2	20.0	19.1	40.9	.9	9.3
20 to 49 employees .....	E4	16	.5	13.0	.2	.5	4.2	26.3	20.6	48.1	1.1	11.8
50 to 99 employees .....	-	9	.6	19.5	.3	.5	4.9	48.1	35.1	78.6	2.3	16.3
100 to 249 employees .....	E2	16	2.7	72.0	1.3	2.9	27.0	200.7	111.9	311.9	7.3	68.1
250 to 499 employees .....	-	7	2.8	66.7	1.5	3.4	29.7	192.2	163.9	365.7	6.4	63.2
500 to 999 employees .....	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees .....	-	4	5.7	200.1	2.4	4.7	73.8	434.3	205.1	620.8	22.0	117.6
Covered by administrative records <sup>2</sup> .....	E9	37	.3	5.4	.1	.3	2.4	10.9	9.8	20.7	.5	4.7
<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.</b>												
Total .....	-	204	28.5	824.8	13.5	26.3	270.8	1 869.8	1 448.4	3 297.2	125.1	829.4
Establishments with an average of—												
1 to 4 employees .....	E8	45	.1	1.4	(Z)	.1	.6	4.5	3.1	7.6	.2	1.8
5 to 9 employees .....	E9	33	.2	4.0	.1	.2	1.7	11.1	8.1	19.0	.5	4.6
10 to 19 employees .....	E7	24	.4	7.0	.2	.4	3.3	23.7	13.3	37.0	.8	10.8
20 to 49 employees .....	E5	33	1.0	25.6	.6	1.7	11.1	58.4	44.8	103.6	2.0	36.5
50 to 99 employees .....	E2	27	1.9	44.3	1.1	2.3	22.1	106.2	84.0	189.3	5.9	46.6
100 to 249 employees .....	-	19	3.0	76.0	1.7	3.5	32.2	152.2	169.8	329.1	6.4	92.6
250 to 499 employees .....	-	9	3.4	80.5	1.7	3.0	28.7	223.9	136.2	350.8	13.0	91.2
500 to 999 employees .....	-	7	4.7	147.4	2.2	4.7	54.1	296.1	189.3	482.4	28.5	103.8
1,000 to 2,499 employees .....	-	6	13.8	438.5	5.9	10.5	117.0	993.7	799.7	1 778.4	67.7	441.4
2,500 employees or more .....	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records <sup>2</sup> .....	E9	95	.7	12.1	.3	.6	5.2	34.1	25.3	59.4	1.5	14.7

See footnotes at end of table.

**Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.**

Note: For qualifications of data, see footnotes on table 1a-1. Data shown as a (D) are included in underscored figures above.

<sup>1</sup>Payroll and sales data for some small single unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

<sup>2</sup>Report forms were not mailed to small single unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1987 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

**Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987**

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3571	<b>Electronic computers:</b> All establishments in industry .....	974	151.9	4 953.0	54.7	105.8	1 126.2	18 322.2	15 222.9	33 626.5	1 223.3
35711	Establishments with this product class primary: Computers (excluding word processors, peripherals, and parts) .....	207	117.2	4 000.4	38.9	74.7	798.9	15 838.2	13 103.0	28 935.3	1 042.5
35712	Parts for computers .....	151	28.1	789.6	13.1	25.8	280.2	2 132.5	1 691.4	3 910.7	160.3
3572	<b>Computer storage devices:</b> All establishments in industry .....	106	43.3	1 442.6	15.0	31.0	328.1	3 268.5	3 252.8	6 394.8	347.0
35721	Establishments with this product class primary: Computer storage equipment, auxiliary .....	57	40.3	1 374.2	13.2	27.3	301.1	3 143.0	3 181.1	6 196.0	330.2
35722	Parts for computer storage equipment, auxiliary .....	14	2.7	60.5	1.7	3.6	24.9	110.6	52.5	164.7	15.9
3575	<b>Computer terminals:</b> All establishments in industry .....	121	15.0	441.7	5.5	10.7	124.1	1 014.3	742.0	1 799.0	58.0
35751	Establishments with this product class primary: Computer terminals .....	71	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35752	Parts for computer terminals .....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3577	<b>Computer peripheral equipment, n.e.c.:</b> All establishments in industry .....	549	76.2	2 625.4	26.2	58.7	579.5	6 918.1	7 107.3	13 965.5	391.2
35771	Establishments with this product class primary: Computer peripheral equipment, n.e.c. ....	211	44.4	1 455.9	16.9	34.2	398.0	4 339.7	3 518.7	7 803.9	198.2
35772	Parts for computer peripheral equipment, n.e.c. ....	60	28.6	1 077.4	7.9	21.8	159.6	2 441.2	3 358.0	5 793.4	183.0
3578	<b>Calculating and accounting equipment:</b> All establishments in industry .....	98	12.8	380.7	6.0	12.4	142.7	937.3	560.6	1 486.8	40.2
35781	Establishments with this product class primary: Accounting machines and cash registers .....	40	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35782	Calculators .....	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35783	Parts for calculating and accounting machines .....	9	1.1	24.8	.6	1.4	10.6	49.2	52.7	105.3	2.4
3579	<b>Office machines, n.e.c.:</b> All establishments in industry .....	204	28.5	824.8	13.5	26.3	270.8	1 869.8	1 448.4	3 297.2	125.1
35792	Establishments with this product class primary: Automatic typing and word processing machines .....	10	4.3	130.9	1.0	1.8	18.2	166.8	327.3	537.3	19.8
35793	Duplicating machines .....	5	1.6	49.3	.7	1.5	14.4	77.3	100.8	181.3	(D)
35795	Mailing, letter handling, and addressing machines .....	27	9.9	351.5	4.4	7.6	97.2	790.3	410.1	1 172.5	45.6
35799	Standard typewriters and office machines, n.e.c. ....	35	8.7	193.0	5.3	11.4	91.9	475.5	422.8	870.0	33.1
3579A	Parts for office machines, n.e.c. ....	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

Note: For qualifications of data, see footnotes on table 1a-1.



**Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments and Specialization and Coverage Ratios for the Industry: 1987 and Earlier Census Years**

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments			
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio col. B ÷ col. B + C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio col. B ÷ col. F (percent)
		A	B	C	D	E	F	G	H	I
3571	Electronic computers ----- 1987..	33 626.5	24 780.3	3 858.3	4 987.9	87	26 624.2	24 780.3	1 843.9	93
3572	Computer storage devices ----- 1987..	6 394.8	5 335.7	277.3	781.8	95	6 904.9	5 335.7	1 569.2	77
3575	Computer terminals ----- 1987..	1 799.0	1 429.8	170.4	198.9	89	2 729.7	1 429.8	1 299.9	52
3577	Computer peripheral equipment, n.e.c. ----- 1987..	13 965.5	10 419.9	2 501.8	1 043.8	81	12 599.0	10 419.9	2 179.1	83
3578	Calculating and accounting machines ----- 1987..	1 486.8	1 105.7	248.1	133.0	82	1 208.5	1 105.7	102.8	91
	----- 1982..	1 487.3	1 078.3	371.9	37.1	74	1 397.5	1 078.3	319.2	77
	----- 1977..	850.0	644.1	127.3	78.6	84	836.2	644.1	192.1	77
3579	Office machines, n.e.c. ----- 1987..	3 297.2	2 240.1	245.4	811.7	90	3 252.7	2 240.1	1 012.6	69
	----- 1982..	4 256.7	3 062.9	724.4	469.4	81	3 512.3	3 062.9	449.4	87
	----- 1977..	2 719.7	1 836.9	589.8	293.0	76	2 020.3	1 836.9	183.4	91

**Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982**

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)
<b>3571--</b>	<b>ELECTRONIC COMPUTERS</b>				
	Total -----	(NA)	<sup>2</sup> 26 624.2	(NA)	( <sup>2</sup> )
35711 -- 35711 00	Computers (excluding word processors, peripherals, and parts): Computers (excluding word processors, peripherals, and parts) (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) -----	239	<sup>3</sup> 21 619.9	251	<sup>3</sup> 10 927.6
35712 -- 35712 00	Parts for computers: Parts for computers (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) -----	245	<sup>4</sup> 4 288.8	(NA)	<sup>4</sup> <sup>5</sup> 3 932.9
35710 -- 35710 00	Electronic computers, n.s.k. -----	(NA)	<sup>6</sup> 715.5	(NA)	(NA)
35710 00	Electronic computing equipment, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	<sup>6</sup> 443.6	(NA)	(NA)
35710 02	Electronic computing equipment, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	<sup>6</sup> 271.9	(NA)	(NA)
<b>3572--</b>	<b>COMPUTER STORAGE DEVICES</b>				
	Total -----	(NA)	<sup>6</sup> 6 904.9	(NA)	( <sup>2</sup> )
35721 -- 35721 00	Computer storage equipment, auxiliary: Auxiliary storage equipment (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) -----	76	<sup>7</sup> 6 311.8	(NA)	(NA)
35722 -- 35722 00	Parts for computer storage equipment, auxiliary: Parts for auxiliary storage equipment (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) -----	38	<sup>4</sup> 559.6	(NA)	(NA)
35720 -- 35720 00	Computer storage devices, n.s.k. -----	(NA)	33.5	(NA)	(NA)
35720 00	Computer storage devices, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	.8	(NA)	(NA)
35720 02	Computer storage devices, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	32.7	(NA)	(NA)

See footnotes at end of table.

**Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)
<b>3575- --</b>	<b>COMPUTER TERMINALS</b>				
	<b>Total .....</b>	(NA)	<sup>2</sup> 2 729.7	(NA)	( <sup>2</sup> )
35751 -- 35751 00	Computer terminals: Computer terminals (excluding point-of-sale and funds-transfer devices) (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	111	2 554.7	(NA)	(NA)
35752 -- 35752 00	Parts for computer terminals: Parts for computer terminals (excluding point-of-sale and funds-transfer devices) (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	23	4139.0	(NA)	(NA)
35750 -- 35750 00	Computer terminal, n.s.k. ....	(NA)	36.0	(NA)	(NA)
	Computer terminals, n.s.k., typically for establishments with 20 employees or more (see note) .....	(NA)	-	(NA)	(NA)
35750 02	Computer terminals, n.s.k., typically for establishments with less than 20 employees (see note) .....	(NA)	36.0	(NA)	(NA)
<b>3577- --</b>	<b>COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>				
	<b>Total .....</b>	(NA)	<sup>2</sup> 12 599.0	(NA)	( <sup>2</sup> )
35771 -- 35771 00	Computer peripheral equipment, n.e.c.: Input/output equipment (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	246	7 955.3	(NA)	(NA)
35772 -- 35772 00	Parts for computer peripheral equipment, n.e.c.: Parts for input/output equipment (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	104	<sup>4</sup> 4 292.8	(NA)	(NA)
35770 -- 35770 00	Computer peripheral equipment, n.e.c., n.s.k. ....	(NA)	351.0	(NA)	(NA)
	Computer peripheral equipment, n.e.c., n.s.k., typically for establishments with 20 employees or more (see note) .....	(NA)	149.0	(NA)	(NA)
35770 02	Computer peripheral equipment, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note) .....	(NA)	201.9	(NA)	(NA)
<b>3578- --</b>	<b>CALCULATING AND ACCOUNTING EQUIPMENT</b>				
	<b>Total .....</b>	(NA)	<sup>6</sup> 1 208.5	(NA)	<sup>8</sup> 1 397.5
35781 -- 35781 00	Accounting machines and cash registers: Accounting machines and cash registers including funds-transfer terminals and point-of-sale terminals (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	51	(D)	46	<sup>9</sup> 952.6
35782 -- 35782 00	Calculators: Calculators (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	7	(D)	12	<sup>9</sup> 250.5
35783 -- 35783 00	Parts and attachments for calculating, accounting machines, cash registers, funds-transfer terminals, and point-of-sale terminals: Parts and attachments for calculating, accounting machines, cash registers, funds-transfer terminals, and point-of-sale terminals (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	20	101.3	(NA)	<sup>9</sup> 182.0
35780 -- 35780 00	Calculating and accounting machines, n.s.k. ....	(NA)	77.4	(NA)	<sup>9</sup> 12.4
	Calculating and accounting machines, n.s.k., typically for establishments with 20 employees or more (see note) .....	(NA)	56.9	(NA)	<sup>9</sup> 4.9
35780 02	Calculating and accounting machines, n.s.k., typically for establishments with less than 20 employees (see note) .....	(NA)	20.6	(NA)	<sup>9</sup> 7.5
<b>3579- --</b>	<b>OFFICE MACHINES, N.E.C.</b>				
	<b>Total .....</b>	(NA)	<b>3 252.7</b>	(NA)	<b>3 512.3</b>
35792 -- 35792 00	Automatic typing and word processing machines: Automatic typing and word processing machines, parts, and attachments (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	18	1 210.0	34	1 491.5
35793 -- 35793 00	Duplicating machines: Duplicating machines, except parts and attachments (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	6	127.2	10	158.8
35795 -- 35795 00	Mailing, letter handling, and addressing machines: Mailing, letter handling, and addressing machines (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	33	811.4	26	387.8
35799 -- 35799 00	Standard typewriters, dictating, transcribing, recording machines, and all other office machines, n.e.c.: Standard typewriters, dictating, transcribing, recording machines, and all other office machines, n.e.c. (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines) .....	54	618.0	68	1 122.6

See footnotes at end of table.



**Table 6a-1. Product and Product Classes—Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments <sup>1</sup> (million dollars)
<b>3579- --</b>	<b>OFFICE MACHINES, N.E.C.—Con.</b>				
3579A --	Parts and attachments for standard typewriters, dictating, duplicating, and other office machines, n.e.c.:				
3579A 00	Parts and attachments for standard typewriters, dictating, duplicating, mailing, letter handling, addressing, and other office machines, n.e.c. (for additional detail, see Current Industrial Report MA-35R, Computers and Office and Accounting Machines)-----	49	317.9	(NA)	306.7
35790 --	Office machines, n.e.c., n.s.k.-----	(NA)	168.2	(NA)	44.9
35790 00	Office machines, n.e.c., n.s.k., typically for establishments with 20 employees or more (see note)-----	(NA)	109.2	(NA)	24.5
35790 02	Office machines, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note)-----	(NA)	59.0	(NA)	20.4

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

<sup>1</sup>Data reported by all producers, not just those with shipments of \$100,000 or more.

<sup>2</sup>Industries 3571, Electronic Computers; 3572, Computer Storage Devices; 3575, Computer Terminals; and 3577, Computer Peripheral Equipment, N.E.C., are published as separate industries for the first time in 1987. They were included in Industry 3573, Electronic Computing Equipment in 1982 and are not available separately.

<sup>3</sup>For 1982, data for product code 35711 00 were published under old Product Code 35731 00, Computers (Excluding Word Processors, Peripherals, and Parts). For 1987, data also include computer kits to be assembled by purchaser which were included as part of old Product Code 36629 00, Electronic Systems and Equipment, N.E.C., in 1982.

<sup>4</sup>Based on discussions with respondents, several companies reported products as "parts for computers" (product codes 35712 00, 35722 00, 35752 00, and/or 35772 00) that should have been classified as electronic components, including printed circuit boards (SIC 3672), complex components (SIC 3679), integrated microcircuits (SIC 3674) or related electronic devices or instruments. These respondents were unable to provide separate estimates of the value of these electronic-type devices included in the computer parts category. Therefore, the magnitude of the problem is unknown, although believed to be a significant proportion of the figure shown. The Census Bureau is working with the Computer and Business Equipment Manufacturers Association and other private and governmental organizations to improve the definitions of these categories and plans to introduce changes in future current industrial reports and annual surveys of manufactures.

<sup>5</sup>For 1982, data for product code 35712 00 were published under old Product Codes 35734 20, Parts for Computers Produced by Complete Machine Manufacturers; 35735 41, Parts for Computers Produced by Other Complete Machine Manufacturers; and 35735 00, Parts, N.S.K.

<sup>6</sup>Data include an indeterminate amount of computer peripheral equipment manufacturers who did not totally identify their products.

<sup>7</sup>For 1987, magnetic storage media for computers are classified in new industry 3695, Magnetic and Optical Recording Media.

<sup>8</sup>For 1987, old industry 3574 was renumbered to new industry 3578.

<sup>9</sup>For 1982, data for new product codes 35781 00, 35782 00, 35783 00, 35780 00, and 35780 02 were published under old product codes 35743 00, 35744 00, 35745 --, 35740 00, and 35740 02, respectively.

**Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982**

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
<b>35711 --</b>	<b>MA35R, COMPUTERS AND OFFICE AND ACCOUNTING MACHINES</b>				
	Computers (excluding word processors, peripherals, and parts)-----thousands..	'4 544.2	'21 852.6	2 099.0	111 355.6
	General-purpose computers:				
	Digital:				
35711 01	Less than \$500 (retail price)-----thousands..	947.4	343.8		
35711 02	\$500 to \$1,000 (retail price)-----do..	'669.0	'511.4		
35711 03	\$1,000 to \$2,500 (retail price)-----do..	'1 159.5	'1 872.7		
35711 04	\$2,500 to \$5,000 (retail price)-----do..	'1 176.7	'3 810.5		
35711 05	\$5,000 to \$15,000 (retail price)-----do..	'201.0	'1 489.3	2 064.4	10 482.7
35711 06	\$15,000 to \$50,000 (retail price)-----do..	129.6	3 114.6		
35711 07	\$50,000 to \$250,000 (retail price)-----do..	21.7	2 715.7		
35711 08	\$250,000 to \$1 million (retail price)-----do..	6.9	2 905.8		
35711 09	More than \$1 million (retail price)-----do..	1.4	1 987.6		
35711 22	Analog-----do..				
35711 25	Hybrid-----do..	3.5	34.4	2.5	87.3
	Special-purpose computers:				
35711 31	Digital-----thousands..	181.8	2 322.5	29.7	637.0
35711 32	Analog-----do..				
35711 33	Hybrid-----do..	41.7	734.9	2.4	148.6
35711 35	Computer kits to be assembled by purchaser-----do..	4.0	9.7	(NA)	(NA)

See footnotes at end of table.

Table 6a-2. **Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.**

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	<b>MA35R, COMPUTERS AND OFFICE AND ACCOUNTING MACHINES—Con.</b>				
35721 —	Computer storage equipment, auxiliary ..... thousands..	4 871.3	6 332.9	2 733.9	4 879.1
	Direct (random) access storage units:				
	Rigid magnetic disk drive:				
35721 23	Less than 5 1/4 inch ..... thousands..	(2)	(2)		
35721 24	5 1/4 inch but less than 8 inch ..... do..	22 359.8	21 043.6		
35721 25	8 inch ..... do..	66.7	584.6		
35721 26	More than 8 inch ..... do..	283.5	2 721.3		
	Flexible magnetic disk drives:			2 442.5	3 727.0
35721 27	Less than 5 1/4 inch ..... thousands..	(3)	(3)		
35721 28	5 1/4 inch but less than 8 inch ..... do..	(3)	(3)		
35721 29	8 inch ..... do..	3766.3	3330.8		
35721 30	More than 8 inch ..... do..				
35721 32	Optical disk drives ..... do..	89.9	130.7	152.1	339.7
35721 33	Other direct access storage units ..... do..	923.1	675.2		
35721 34	Serial access storage units, such as magnetic tape storage units (magnetic tape drives) ..... do..	381.9	846.7	139.3	812.4
35771 —	Computer peripheral equipment, n.e.c. .... (X)		7 695.7	(X)	(1)
	Keying equipment (key entry data preparation):				
35771 52	Key-disk or diskette ..... thousands.. (D)		(D)	24.4	66.9
35771 54	Key-tape (reels, cassette, or cartridge) ..... do.. (D)		(D)		
35771 56	Keypunch verify (cards) ..... do.. (D)		(D)	23.1	36.5
35771 58	Other keying equipment ..... do..	4 467.1	399.8		
35771 59	Systems oriented punched card equipment (card readers, tabulators, collators, sorters, and interpreters) ..... do..	12.8	14.3	6.5	20.2
	Media-to-media data conversion equipment:				
35771 61	Computer output to microfilm recording units (roll film, microfiche, on-line and off-line units) ..... thousands.. (D)		(D)	5.3	78.4
35771 62	Tape print units (stand-alone tape or disk-to-printunits) ..... do.. (D)		(D)		
35771 63	Card-tape conversion (stand-alone card-to-tape-conversion) ..... do.. (D)		(D)		
	Document entry conversion (input documents such as written pages, special cards, magnetic ink encoded sheets):				
35771 64	Optical scanning devices:				
35771 65	Character recognition ..... thousands..	155.5	352.4	44.2	119.3
	Page recognition ..... do..	9.4	41.2		
	Voice recognition devices (voice signal and digital output):				
35771 66	Less than 500 words ..... thousands..			(4)	(4)
35771 67	500 words or more ..... do..	3.7	19.6	(4)	(4)
35771 69	Magnetic ink recognition devices ..... do..	52.2	65.9	462.6	4136.1
35771 71	Other document entry conversion devices ..... do..				
	Computer printers	1 625.5	3 323.7	5614.2	51 633.6
	Serial type:				
35771 72	Impact ..... thousands..	1 142.2	1 285.8	(5)	(5)
35771 73	Nonimpact ..... do..	307.7	1 270.4	(5)	(5)
	Line type:				
35771 74	Impact ..... thousands..			(5)	(5)
35771 75	Nonimpact ..... do..	119.2	540.7	(5)	(5)
35771 76	Page type ..... do..	56.4	226.8	(5)	(5)
	Computer plotters ..... do..	123.4	532.7	415.7	4247.5
35771 77	Less than \$500 ..... do..			(6)	(6)
35771 78	\$501 to \$2,500 ..... do..	123.1	507.1	(6)	(6)
35771 79	\$2,501 to \$15,000 ..... do..			(6)	(6)
35771 81	\$15,000 or more ..... do..	.3	25.6	(6)	(6)
35771 82	Monitor-like or graphic displays, excluding graphics terminals ..... do..	210.8	149.2	14.1	164.6
35771 83	Computer paper tape punchers or readers ..... do..	3.4	4.3	14.8	9.9
35771 84	All other input/output devices ..... do..	9 044.5	1 154.7	513.7	643.0
35771 94	Other types of peripheral equipment ..... do..	1 619.6	1 450.2	422.6	1 041.
35751 —	Computer terminals ..... do..	2 262.1	2 429.2	(NA)	(1)
	General-purpose:				
	Single CRT terminal (usually operates with a modem for linking through a telephone line, data is displayed via a cathode ray tube):				
35751 21	Mono (one color) ..... thousands..	571.2	316.0	1 096.1	2 137.8
35751 22	Color (more than one color) ..... do..	310.5	138.1		
35751 24	Alphanumeric display terminals based on CRT displays; typically including a keyboard and sometimes including a serial printer or tape cassette ..... do..	147.6	90.0	(NA)	(NA)
	Teleprinter (interactive terminals with a hard-copy printer, may also include a paper tape punch or other add-on devices):				
35751 75	20 cps or less ..... thousands..	41.8	37.3	231.1	276.9
35751 76	21 to 100 cps ..... do..				
35751 77	101 to 200 cps ..... do..	100.1	118.3	139.1	219.5
35751 78	More than 200 cps ..... do..	117.6	164.3		
35751 80	Multistation CRT/teleprinter (usually have programmable capabilities) ..... do..	48.3	116.4	13.0	109.0
	Remote batch terminal (remote job entry and output devices) ..... do..				
35751 81	Add-on devices for general-purpose computer terminals ..... do..	203.6	175.4	45.2	303.5
35751 82	Other general-purpose computer terminals ..... do..	250.3	299.4	114.9	303.5
	Special-purpose:				
35751 85	Graphic terminals ..... thousands..	268.5	508.0	45.6	454.5
35751 86	Other special-purpose terminals, except funds transfer and point-of-sale terminals ..... do..	202.6	466.1	110.1	252.1
	Parts and components for computers and peripherals:				
35712 05	For computers ..... (X)		4 061.8	(X)	(1)
35722 11	For auxiliary storage equipment ..... (X)		554.0	(X)	(1)
35772 31	For input/output equipment ..... (X)		265.0	(X)	(1)
35752 41	For computer terminals ..... (X)		123.0	(X)	(1)
35772 61	For other peripheral equipment ..... (X)		3 965.7	(X)	(1)

See footnotes at end of table.



Table 6a-2. **Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.**

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	<b>MA35R, COMPUTERS AND OFFICE AND ACCOUNTING MACHINES—Con.</b>				
35781 —	Accounting machines and cash registers .....	370.6	942.6	291.1	901.2
35781 11	Automatic banknote dispensers .....	(7)	(7)		
35781 14	Coin-sorting and dispensing machines .....	(7)	(7)		
35781 17	Coin and currency counting and wrapping machines .....	727.4	750.9		
35781 19	Money changing machines .....	(9)	(9)	79.3	155.7
35781 49	Other coin and currency handling machines (not listed above) and payroll denominating machines .....	890.8	871.3		
35781 54	Funds transfer terminals .....	39.5	287.6	34.2	311.0
35781 55	Point-of-sale terminals (POS) .....	163.3	496.8	130.0	330.9
35781 51	Cash registers, including adding machines with cashdrawers .....			47.6	103.6
35781 99	Accounting and bookkeeping machines (including billing machines and other calculating and accounting machines, including rebuilt) .....	49.6	36.0		
35782 —	Calculators .....	(D)	(D)	(NA)	239.1
35782 32	Calculators capable of operating only with battery or light-cell power .....	(D)	(D)	3 437.7	239.1
35782 36	Other .....	(D)	(D)		
35783 —	Parts and attachments for calculating, accounting machines, cash registers, funds-transfer terminals, and point-of-sale terminals .....	(X)	99.9	(X)	(1)
35783 27	For coin and currency handling machines, accounting machines, and cash registers sold separately .....	(X)	99.9	(X)	(NA)
35783 25	For funds transfer and point-of-sales terminals .....			(X)	(NA)
35783 59	For calculators, sold separately (value only) .....			(X)	(NA)
35792 —	Automatic typing and word processing machines .....	(X)	1 197.2	(X)	11 479.2
35792 21	Electronic typewriters without display .....	(D)	(D)		
35792 23	Electronic typewriters with display: .....	(9)	(9)	187.3	1 001.7
35792 25	Half page display .....	8275.9	8636.5		
35792 28	Full page display .....	(D)	(D)		
35792 25	Electronic full page shared typing systems .....				
35792 50	Parts and attachments for automatic typing and wordprocessing machines, sold separately .....	(X)	(D)	(X)	477.5
35793 —	Duplicating machines, except parts and attachments .....	36.3	125.9	(NA)	155.9
35793 07	Spirit .....			46.3	64.5
35793 09	Stencil .....	21.0	13.4	8.8	9.2
35793 16	Offset .....			10.3	82.2
35793 19	Other (including gelatin and ribbon and ink) .....	15.3	112.6		
35795 —	Mailing, letter handling, and addressing machines (except parts and attachments) .....	559.8	800.9	(NA)	386.8
35795 34	Forms handling equipment including bursters, decollators, and im printers .....	316.7	58.8	26.2	42.6
35795 36	Mailing machines (including mail sorting machines, mail typing (bundling) machines, mail canceling (post office) machinery, stamp affixers) (excluding mailing and parcel post scales, which are included in SIC 3576, Scales and Balances) .....	190.9	432.2	162.1	173.4
35795 38	Postage franking machines .....				
35795 43	Letter and envelope handling machines, including envelope opening and sealing machines, letter folding, and inserting machines .....	33.6	213.5	14.5	67.9
35795 45	Collating machines .....	6.6	25.5	9.2	20.8
35795 47	Addressing machines, including address labeling machines, addressing plate embossers, and addresser-printer machines .....	12.0	70.9	(NA)	82.1
35799 —	Standard typewriters, dictating, transcribing, recording, machines, and all other office machines, n.e.c. (except parts and attachments) .....	(X)	571.7	(X)	1 032.0
35799 06	Typewriters, standard all types, including electric, nonelectric, electronic, portable, and nonportable .....	(X)	(10)	(X)	(10)
35799 21	Dictating, transcribing, and recording machines (all media) systems .....	(D)	(D)	13.8	11.7
35799 39	Other, including desk units, portable units, and transcribing units .....				
35799 31	All other office machines, n.e.c.: .....				
35799 32	Check handling machines including, canceling, cutting, dating, endorsing, numbering, protecting, signing, and writing machines .....	74.1	94.4	130.5	58.6
35799 33	Electric stapling machines (office type) .....	(D)	(D)	51.0	5.4
35799 41	Time recording and time stamp machines .....	251.3	91.5	154.9	59.0
35799 43	Paper cutting machines and apparatus (office type) .....	(X)	(11)		
35799 43	Pencil sharpeners (all types) .....	(X)	(11)		
35799 45	Perforating or stapling machines (nonelectric) .....	(X)	1139.5		
35799 47	Ticket issuing and counting machines .....	(X)	(D)	(X)	10897.3
35799 98	All other office machines, n.e.c. (including shorthand writing machines, voting machines, and rebuilt office machines, n.e.c.) .....	(X)	10257.7		
3579A —	Parts and attachments for standard typewriters, dictating, duplicating, and other office machines, n.e.c. .....	(X)	313.9	(X)	(1)
3579A 20	For duplicating machines (sold separately) .....	(X)	104.0	(X)	(NA)
3579A 40	For dictating, transcribing, and recording machines sold separately .....				
3579A 44	For standard typewriters .....	(X)	209.9	(X)	(NA)
3579A 50	For office machines, n.e.c., except duplicating machines and dictating equipment, sold separately .....				

<sup>1</sup>For complete listing of 1982 product detail, see 1983 Current Industrial Report Series MA-35R, Computers and Office and Accounting Machines.

<sup>2</sup>For 1987, data for product codes 35721 23 and 35721 24 are combined to avoid disclosing data for individual companies.

<sup>3</sup>For 1987, data for product codes 35721 27, 35721 28, and 35721 29 are combined to avoid disclosing data for individual companies.

<sup>4</sup>For 1982, data for product codes 35771 66 and 35771 67 were not collected separately but included with product code 35771 71.

<sup>5</sup>For 1982, data for product codes 35771 72 through 35771 76 were not collected separately but included with total.

<sup>6</sup>For 1982, data for product codes 35771 77 through 35771 81 were not collected separately but included with total.

<sup>7</sup>For 1987, data for product codes 35781 11, 35781 14, and 35781 17 are combined to avoid disclosing data for individual companies.

<sup>8</sup>For 1987, product code 35781 19 is combined with product code 35781 49 to avoid disclosing data for individual companies.

Table 6a-2. **Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.**

<sup>9</sup>For 1987, data for product codes 35792 23 and 35792 25 were combined to avoid disclosing data for individual companies.

<sup>10</sup>For 1987 and 1982, product code 35799 06 is combined with product code 35799 98 to avoid disclosing data for individual companies.

<sup>11</sup>For 1987, data for product codes 35799 41, 35799 43, and 35799 45 are combined to avoid disclosing data for individual companies.

Table 6b. **Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982**

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
<b>35711, COMPUTERS (EXCLUDING WORD PROCESSORS, PERIPHERALS, AND PARTS)</b>			<b>35771, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>		
United States .....	21 619.9	10 927.6	United States .....	7 955.3	(NA)
California .....	5 743.8	2 498.7	Arizona .....	97.8	(NA)
Georgia .....	13.6	43.4	California .....	3 152.0	(NA)
Indiana .....	2.1	(NA)	Connecticut .....	123.8	(NA)
Massachusetts .....	3 753.0	1 450.8	Florida .....	137.8	(NA)
Minnesota .....	1 235.9	1 353.4	Illinois .....	29.6	(NA)
New Jersey .....	120.1	103.2	Massachusetts .....	670.3	(NA)
Ohio .....	21.3	(NA)	Michigan .....	21.8	(NA)
Oregon .....	165.5	(NA)	Minnesota .....	265.1	(NA)
Pennsylvania .....	264.5	289.6	New Hampshire .....	251.6	(NA)
Texas .....	1 921.9	979.2	New York .....	472.7	(NA)
Washington .....	8.5	(NA)	Ohio .....	90.0	(NA)
			Oregon .....	103.8	(NA)
<b>35712, PARTS FOR COMPUTERS</b>			Pennsylvania .....	167.7	(NA)
United States .....	4 288.8	3 932.9	Texas .....	283.1	(NA)
Arizona .....	123.2	(NA)	Washington .....	124.2	(NA)
California .....	1 056.7	(NA)			
Colorado .....	36.5	(NA)	<b>35772, PARTS FOR COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>		
Florida .....	58.8	(NA)	United States .....	4 292.8	(NA)
Illinois .....	21.3	(NA)	California .....	314.1	(NA)
Massachusetts .....	633.4	(NA)	Massachusetts .....	107.6	(NA)
New Hampshire .....	230.9	(NA)	Michigan .....	4.4	(NA)
North Carolina .....	26.0	(NA)	New York .....	158.7	(NA)
Ohio .....	7.2	(NA)	Pennsylvania .....	7.7	(NA)
Pennsylvania .....	24.5	(NA)	Washington .....	128.7	(NA)
Texas .....	304.4	(NA)			
<b>35721, COMPUTER STORAGE EQUIPMENT, AUXILIARY</b>			<b>35781, ACCOUNTING MACHINES AND CASH REGISTERS</b>		
United States .....	6 311.8	(NA)	United States .....	(D)	952.6
California .....	2 148.4	(NA)	California .....	246.7	(NA)
Colorado .....	957.0	(NA)	Massachusetts .....	25.2	(NA)
Minnesota .....	1 327.9	(NA)	New Jersey .....	19.9	(NA)
			Pennsylvania .....	42.4	(NA)
<b>35722, PARTS FOR COMPUTER STORAGE EQUIPMENT, AUXILIARY</b>			<b>35795, MAILING, LETTER HANDLING, AND ADDRESSING MACHINES</b>		
United States .....	559.6	(NA)	United States .....	811.4	387.8
California .....	400.0	(NA)	California .....	54.7	36.4
Minnesota .....	92.1	(NA)	Illinois .....	37.9	19.2
			New York .....	6.5	(NA)
<b>35751, COMPUTER TERMINALS</b>			<b>35799, STANDARD TYPEWRITERS AND OFFICE MACHINES, N.E.C.</b>		
United States .....	2 554.7	(NA)	United States .....	618.0	1 122.6
California .....	431.7	(NA)	California .....	28.7	9.1
Florida .....	42.1	(NA)	Illinois .....	107.4	145.1
Massachusetts .....	204.8	(NA)	Massachusetts .....	86.3	(NA)
Missouri .....	19.1	(NA)			
New Hampshire .....	54.4	(NA)	<b>3579A, PARTS FOR OFFICE MACHINES, N.E.C.</b>		
New York .....	96.6	(NA)	United States .....	317.9	306.7
Texas .....	147.5	(NA)	California .....	61.1	37.6
<b>35752, PARTS FOR COMPUTER TERMINALS</b>			Illinois .....	75.9	(NA)
United States .....	139.0	(NA)	Pennsylvania .....	13.6	5.9
California .....	29.1	(NA)			



**Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1987 and Earlier Years**

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

1987 product code	Product class	1987	1986 <sup>1</sup>	1985 <sup>1</sup>	1984 <sup>1</sup>	1983 <sup>1</sup>	1982	1977	1972
3571-	<b>Electronic computers</b> .....	<b>26 624.2</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>
35711	Computers (excluding word processors, peripherals, and parts) .....	21 619.9	19 959.1	19 742.0	16 956.7	12 420.4	10 927.6	3 546.9	1 894.3
35712	Parts for computers .....	4 288.8	(NA)	(NA)	(NA)	(NA)	3 932.9	1 247.0	629.6
35710	Electronic computers, n.s.k. ....	715.5	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
3572-	<b>Computer storage devices</b> .....	<b>6 904.9</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>
35721	Computer storage equipment, auxiliary .....	6 311.8	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35722	Parts for computer storage equipment, auxiliary .....	559.6	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35720	Computer storage devices, n.s.k. ....	33.6	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
3575-	<b>Computer terminals</b> .....	<b>2 729.7</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>
35751	Computer terminals .....	2 554.7	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35752	Parts for computer terminals .....	139.0	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35750	Computer terminals, n.s.k. ....	36.0	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
3577-	<b>Computer peripheral equipment, n.e.c.</b> .....	<b>12 599.0</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>
35771	Computer peripheral equipment, n.e.c. ....	7 955.3	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35772	Parts for computer peripheral equipment, n.e.c. ....	4 292.8	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
35770	Computer peripheral equipment, n.e.c., n.s.k. ....	351.0	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
3578-	<b>Calculating and accounting equipment</b> .....	<b>1 208.5</b>	<b>1 172.3</b>	<b>1 228.1</b>	<b>1 447.9</b>	<b>1 385.6</b>	<b>1 397.5</b>	<b>836.2</b>	<b>694.2</b>
35781	Accounting machines and cash registers .....	(D)	850.4	908.1	1 120.6	1 025.5	952.6	402.9	(D)
35782	Calculators .....	(D)	152.1	150.9	168.2	204.1	250.5	369.5	(D)
35783	Parts for calculating and accounting machines .....	101.3	153.6	157.8	147.4	141.9	182.0	59.0	(D)
35780	Calculating and accounting machines, n.s.k. ....	77.4	16.2	11.3	11.6	14.1	12.4	4.8	11.0
3579-	<b>Office machines, n.e.c.</b> .....	<b>3 252.7</b>	<b>3 293.6</b>	<b>4 075.2</b>	<b>3 839.9</b>	<b>3 712.8</b>	<b>3 512.3</b>	<b>2 020.3</b>	<b>1 046.9</b>
35792	Automatic typing and word processing machines .....	1 210.0	1 169.1	1 811.0	1 872.0	1 628.8	1 491.5	(NA)	(NA)
35793	Duplicating machines .....	127.2	170.1	157.2	202.7	173.3	158.8	199.7	83.6
35795	Mailing, letter handling, and addressing machines .....	811.4	801.3	595.0	536.1	521.9	387.8	235.3	128.6
35799	Standard typewriters and office machines, n.e.c. ....	618.0	795.7	1 197.3	913.9	967.1	1 122.6	(NA)	(NA)
3579A	Parts for office machines, n.e.c. ....	317.9	296.1	266.9	231.6	333.6	306.7	(NA)	(NA)
35790	Office machines, n.e.c., n.s.k. ....	168.2	61.3	47.9	83.6	88.0	44.9	38.0	18.0

<sup>1</sup>Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

**Table 7. Materials Consumed by Kind: 1987 and 1982**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3571, ELECTRONIC COMPUTERS</b>				
	Materials, parts, containers, and supplies -----	(X)	12 204.6	(X)	( <sup>3</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	.8	(NA)	(NA)
331012	Sheet and strip ----- do..	]	34.9	(NA)	(NA)
331015	Structural shapes ----- do..			(NA)	(NA)
331017	Wire and wire products ----- do..			(NA)	(NA)
331056	All other carbon steel mill shapes and forms..... do..			(NA)	(NA)
331020	Alloy steel, except stainless ----- do..	(S)	(Z)	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	]	3.4	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..			(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) ----- mil lb..	]	23.1	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..			(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do..			(NA)	(NA)
335003	Other ----- do..			(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	]	89.7	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..			(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..			(NA)	(NA)
335006	Other nonferrous ----- do..			(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	-	-	(NA)	(NA)
332045	Steel ----- do..	*.6	1.1	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(D)	(D)	(NA)	(NA)
336003	Other nonferrous ----- do..	(D)	(D)	(NA)	(NA)
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362115	Fractional horsepower electric motors, excluding timing motors ----- thousands..	(S)	11.7	(NA)	(NA)
362110	Timing motors, synchronous and subsynchronous ----- do..	(D)	(D)	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more) ----- do..	(D)	(D)	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball -----	]	3.1	(NA)	(NA)
356201	Roller -----			(NA)	(NA)
344401	Sheet metal products, except stampings -----	(X)	84.9	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products --	(X)	24.3	(NA)	(NA)
34690 <sup>1</sup>	Metal stampings -----	(X)	43.3	(NA)	(NA)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3571, ELECTRONIC COMPUTERS— Con.</b>				
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.)	(X)	144.3	(NA)	(NA)
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices	(X)	21.4	(NA)	(NA)
367010	Electron tubes, except x-ray	(D)	(D)	(NA)	(NA)
367408	Semiconductors	(X)	1 600.0	(NA)	(NA)
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors				
	Parts for computers and peripheral equipment:				
357002	For computers				
357201	For auxiliary storage equipment	(X)	46 740.4	(NA)	(NA)
357701	For input/output equipment				
357501	For computer terminals (excluding point-of-sale and funds- transfer devices)				
366130	For communication interface equipment				
357003	For other peripheral equipment				
260003	Paper and paperboard products and corrugated paper, except paperboard boxes and containers	(X)	13.5	(NA)	(NA)
265001	Paperboard boxes and containers and corrugated paperboard	(S)	45.0	(NA)	(NA)
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets	(X)	1.4	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content)	(S)	39.2	(NA)	(NA)
335770	Magnet wire	(D)	(D)	(NA)	(NA)
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	134.6	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies	(X)	1 574.9	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup>	(X)	1 276.1	(NA)	(NA)
	<b>INDUSTRY 3572, COMPUTER STORAGE DEVICES</b>				
	<b>Materials, parts, containers, and supplies</b>	(X)	2 778.0	(X)	( <sup>3</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes	(S)	.1	(NA)	(NA)
331012	Sheet and strip			(NA)	(NA)
331015	Structural shapes			(NA)	(NA)
331017	Wire and wire products	(S)	2.8	(NA)	(NA)
331056	All other carbon steel mill shapes and forms			(NA)	(NA)
331020	Alloy steel, except stainless	(D)	(D)	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip	(D)	(D)	(NA)	(NA)
331050	All other stainless steel mill shapes and forms	(S)	(Z)	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only)	(D)	(D)	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes	(S)	(Z)	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs	(D)	(D)	(NA)	(NA)
335003	Other	(S)	(Z)	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil	(D)	(D)	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc.			(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.)	2.8	7.0	(NA)	(NA)
335006	Other nonferrous	(X)	-	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable)	(D)	(D)	(NA)	(NA)
332045	Steel	(D)	(D)	(NA)	(NA)
336005	Aluminum and aluminum-base alloy	(S)	11.9	(NA)	(NA)
336003	Other nonferrous	(S)	(Z)	(NA)	(NA)
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp): Fractional horsepower electric motors, excluding timing motors	(D)	(D)	(NA)	(NA)
362110	Timing motors, synchronous and subsynchronous	(D)	(D)	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more)	-	-	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	3.9	(NA)	(NA)
356201	Roller	(X)	(Z)	(NA)	(NA)
344401	Sheet metal products, except stampings	(X)	9.3	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products	(X)	10.6	(NA)	(NA)
346901	Metal stampings	(X)	(D)	(NA)	(NA)
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.)	(X)	2.4	(NA)	(NA)
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices	(X)	.2	(NA)	(NA)

See footnotes at end of table.



Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3572, COMPUTER STORAGE DEVICES—Con.</b>				
367010	Electron tubes, except x-ray ----- millions--	-	-	(NA)	(NA)
367408	Semiconductors -----	(X)	49.9	(NA)	(NA)
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors -----				
	Parts for computers and peripheral equipment:				
357002	For computers -----				
357201	For auxiliary storage equipment -----	(X)	42 222.1	(NA)	(NA)
357701	For input/output equipment -----				
357501	For computer terminals (excluding point-of-sale and funds- transfer devices) -----				
336130	For communication interface equipment -----				
357003	For other peripheral equipment -----				
260003	Paper and paperboard products and corrugated paper, except paperboard boxes and containers -----	(X)	3.9	(NA)	(NA)
265001	Paperboard boxes and containers and corrugated paperboard ----- 1,000 s tons--	**2.6	4.4	(NA)	(NA)
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets -----	(X)	.2	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- mil lb--	(D)	(D)	(NA)	(NA)
335770	Magnet wire ----- do--	(S)	.1	(NA)	(NA)
308006	Fabricated plastics products (except gaskets, hose, and belting) -----	(X)	17.3	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies -----	(X)	208.5	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> -----	(X)	183.5	(NA)	(NA)
	<b>INDUSTRY 3575, COMPUTER TERMINALS</b>				
	Materials, parts, containers, and supplies -----	(X)	652.9	(X)	( <sup>3</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons--	(D)	( <sup>5</sup> )	(NA)	(NA)
331012	Sheet and strip ----- do--	(D)	( <sup>5</sup> )	(NA)	(NA)
331015	Structural shapes ----- do--	-	-	(NA)	(NA)
331017	Wire and wire products ----- do--	(S)	51.4	(NA)	(NA)
331056	All other carbon steel mill shapes and forms ----- do--	-	-	(NA)	(NA)
331020	Alloy steel, except stainless ----- do--	(S)	(Z)	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons--	(S)	(Z)	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do--	(D)	(D)	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) ----- mil lb--	(S)	(Z)	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do--	-	-	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do--	(S)	(Z)	(NA)	(NA)
335003	Other ----- do--	-	-	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb--	(S)	(Z)	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do--	(S)	.3	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do--	-	-	(NA)	(NA)
335006	Other nonferrous ----- do--	(X)	-	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons--	(D)	(D)	(NA)	(NA)
332045	Steel ----- do--	-	-	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb--	(D)	(D)	(NA)	(NA)
336003	Other nonferrous ----- do--	(D)	(D)	(NA)	(NA)
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362115	Fractional horsepower electric motors, excluding timing motors ----- thousands--	(D)	(D)	(NA)	(NA)
362110	Timing motors, synchronous and subsynchronous ----- do--	(S)	.9	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more) ----- do--	(S)	(Z)	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	(D)	(NA)	(NA)
356201	Roller -----	(X)	(Z)	(NA)	(NA)
344401	Sheet metal products, except stampings -----	(X)	6.8	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	1.2	(NA)	(NA)
346901	Metal stampings -----	(X)	2.2	(NA)	(NA)
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.) -----	(X)	7.0	(NA)	(NA)
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices -----	(X)	(D)	(NA)	(NA)
367010	Electron tubes, except x-ray ----- millions--	(S)	15.7	(NA)	(NA)

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982			
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)		
	<b>INDUSTRY 3575, COMPUTER TERMINALS—Con.</b>						
367408	Semiconductors .....	(X)	52.5	(NA)	(NA)		
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors .....	]	4213.3	(NA)	(NA)		
357002	Parts for computers and peripheral equipment:						
357201	For computers .....						
357701	For auxiliary storage equipment .....						
357501	For input/output equipment .....						
	For computer terminals (excluding point-of-sale and funds- transfer devices) .....						
366130	For communication interface equipment .....						
357003	For other peripheral equipment .....						
260003	Paper and paperboard products and corrugated paper, except paperboard boxes and containers .....	(X)	.3	(NA)	(NA)		
265001	Paperboard boxes and containers and corrugated paperboard .....	(S)	1.1	(NA)	(NA)		
	1,000 s tons..						
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets .....	(X)	(Z)	(NA)	(NA)		
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) .....	(S)	1.8	(NA)	(NA)		
335770	Magnet wire .....	(S)	(Z)	(NA)	(NA)		
	do..						
308006	Fabricated plastics products (except gaskets, hose, and belting) .....	(X)	13.8	(NA)	(NA)		
970099	All other materials and components, parts, containers, and supplies .....	(X)	175.4	(NA)	(NA)		
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> .....	(X)	153.0	(NA)	(NA)		
	<b>INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.</b>						
	Materials, parts, containers, and supplies .....	(X)	6 290.9	(X)	( <sup>3</sup> )		
	Mill shapes and forms, except castings and forgings:						
	Carbon steel:						
331011	Bars and bar shapes .....	*3.4	7.7	(NA)	(NA)		
331012	Sheet and strip .....	]	7.3	(NA)	(NA)		
331015	Structural shapes .....			(S)	(NA)	(NA)	
331017	Wire and wire products .....			(NA)	(NA)		
331056	All other carbon steel mill shapes and forms .....			(NA)	(NA)		
331020	Alloy steel, except stainless .....	(S)	5.2	(NA)	(NA)		
	do..						
	Stainless steel:						
331033	Sheet and strip .....	**1.2	6.3	(NA)	(NA)		
331050	All other stainless steel mill shapes and forms .....	]	-	(NA)	(NA)		
	do..			(NA)	(NA)		
	Copper and copper-base alloy:						
335728	Bare wire (for electrical conduction only) .....						
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes .....	(S)	.8	(NA)	(NA)		
335143	Plate, sheet, and strip, including military cups and discs .....	]	-	(NA)	(NA)		
335003	Other .....			(NA)	(NA)		
	do..			(NA)	(NA)		
	Aluminum and aluminum-base alloy:						
335301	Sheet, plate, and foil .....	(S)	9.8	(NA)	(NA)		
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ....	(S)	5.7	(NA)	(NA)		
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) .....	(S)	.2	(NA)	(NA)		
335006	Other nonferrous .....	(X)	( <sup>6</sup> )	(NA)	(NA)		
	do..						
	Castings (rough and semifinished):						
332011	Iron (gray and malleable) .....	(S)	.6	(NA)	(NA)		
332045	Steel .....	(D)	( <sup>6</sup> )	(NA)	(NA)		
336005	Aluminum and aluminum-base alloy .....	(S)	21.7	(NA)	(NA)		
336003	Other nonferrous .....	.2	1.0	(NA)	(NA)		
	do..						
	Electric motors and generators:						
362115	Fractional horsepower electric motors (less than 1 hp): Fractional horsepower electric motors, excluding timing motors .....	**2 924.2	37.5	(NA)	(NA)		
362110	Timing motors, synchronous and subsynchronous .....	(S)	6.8	(NA)	(NA)		
362120	Integral horsepower motors and generators (1 hp or more) .....	(D)	( <sup>6</sup> )	(NA)	(NA)		
	do..						
	Bearings, including mounted and unmounted:						
356218	Ball .....	]	7.3	(NA)	(NA)		
356201	Roller .....			(X)	(NA)	(NA)	
344401	Sheet metal products, except stampings .....			(X)	64.1	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products .....			(X)	22.5	(NA)	(NA)
346901	Metal stampings .....	(X)	15.3	(NA)	(NA)		
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.) .....	(X)	67.2	(NA)	(NA)		
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices .....	(X)	( <sup>6</sup> )	(NA)	(NA)		
367010	Electron tubes, except x-ray .....	*1.4	8.4	(NA)	(NA)		
	millions..						

See footnotes at end of table.



Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
INDUSTRY 3577, COMPUTER PERIPHERAL EQUIPMENT, N.E.C.—Con.					
367408	Semiconductors	(X)	182.6	(NA)	(NA)
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors				
	Parts for computers and peripheral equipment:				
357002	For computers	(X)	*3 771.9	(NA)	(NA)
357201	For auxiliary storage equipment				
357701	For input/output equipment				
357501	For computer terminals (excluding point-of-sale and funds- transfer devices)				
366130	For communication interface equipment				
357003	For other peripheral equipment				
260003	Paper and paperboard products and corrugated paper, except paperboard boxes and containers	(X)	14.1	(NA)	(NA)
265001	Paperboard boxes and containers and corrugated paperboard 1,000 s tons	(S)	22.7	(NA)	(NA)
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets	(X)	4.7	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) mil lb	(S)	6.0	(NA)	(NA)
335770	Magnet wire do	(D)	( <sup>6</sup> )	(NA)	(NA)
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	109.8	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies	(X)	*1 132.8	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup>	(X)	750.9	(NA)	(NA)
INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT					
	Materials, parts, containers, and supplies	(X)	516.1	(X)	654.9
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons	(D)	(D)		
331012	Sheet and strip do	(D)	(D)		
331015	Structural shapes do	(D)	(D)	(S)	9.3
331017	Wire and wire products do	(D)	(D)		
331056	All other carbon steel mill shapes and forms do	(D)	(D)		
331020	Alloy steel, except stainless do	-	-	(Z)	(Z)
	Stainless steel:				
331033	Sheet and strip 1,000 s tons	(D)	(D)	(D)	(D)
331050	All other stainless steel mill shapes and forms do	(S)	(Z)	(D)	(D)
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) mil lb	-	-	(D)	(D)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes do	(S)	(Z)	-	-
335143	Plate, sheet, and strip, including military cups and discs do	(D)	(D)	(D)	(D)
335003	Other do	-	-	(D)	(D)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil mil lb			(D)	(D)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc do	(S)	2.3	(D)	(D)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do			(D)	(D)
335006	Other nonferrous	(X)	(D)	(X)	( <sup>7</sup> )
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons	(S)	(Z)	(D)	(D)
332045	Steel do	(D)	(D)	(D)	(D)
336005	Aluminum and aluminum-base alloy mil lb	(D)	(D)	(D)	(D)
336003	Other nonferrous do	(D)	(D)	-	-
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362115	Fractional horsepower electric motors, excluding timing motors thousands	(D)	(D)	(S)	1.1
362110	Timing motors, synchronous and subsynchronous do	169.1	2.4	(S)	3.0
362120	Integral horsepower motors and generators (1 hp or more) do	-	-	-	-
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	.3	(X)	(Z)
356201	Roller			(X)	(Z)
344401	Sheet metal products, except stampings	(X)	7.3	(X)	5.5
345001	Bolts, nuts, screws, rivets, and screw machine products	(X)	9.3	(X)	3.5
346901	Metal stampings	(X)	15.6	(X)	6.7
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.)	(X)	4.8	(X)	6.5
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices	(X)	.4	(X)	12.8
367010	Electron tubes, except x-ray millions	(S)	2.3	(S)	4.0

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3578, CALCULATING AND ACCOUNTING EQUIPMENT—Con.</b>				
367408	Semiconductors	(X)	53.8	(S)	82.1
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors				
	Parts for computers and peripheral equipment:				
357002	For computers				
357201	For auxiliary storage equipment	(X)	4110.6	(X)	229.2
357701	For input/output equipment				
357501	For computer terminals (excluding point-of-sale and funds- transfer devices)				
366130	For communication interface equipment				
357003	For other peripheral equipment				
260003	Paper and paperboard products and corrugated paper, except paperboard boxes and containers	(X)	(D)	(X)	(D)
265001	Paperboard boxes and containers and corrugated paperboard 1,000 s tons.	(S)	2.9	(D)	(D)
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets	(X)	(D)	(X)	(Z)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) mil lb.	(S)	1.9	(D)	(D)
335770	Magnet wire do.	(D)	(D)	(D)	(D)
308006	Fabricated plastics products (except gaskets, hose, and belting)	(X)	17.6	(X)	27.2
970099	All other materials and components, parts, containers, and supplies	(X)	115.6	(X)	7124.4
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup>	(X)	156.4	(X)	102.3
	<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.</b>				
	Materials parts, containers, and supplies	(X)	1 072.0	(X)	1 257.7
	Mill shapes and forms except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons.	*4.1	4.4	(S)	14.0
331012	Sheet and strip do.	*9.7	12.2	(S)	21.2
331015	Structural shapes do.	(S)	1.7	*.8	1.7
331017	Wire and wire products do.	(S)	(S)	(S)	7.0
331056	All other carbon steel mill shapes and forms do.	**1.0	.5	1.3	2.6
331020	Alloy steel, except stainless do.	(D)	(D)	*2.0	2.6
	Stainless steel:				
331033	Sheet and strip 1,000 s tons.	(S)	.5	(S)	7.8
331050	All other stainless steel mill shapes and forms do.	.2	.8	**3	1.8
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) mil lb.	(D)	(D)		
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes do.	(S)	(Z)	(S)	3.6
335143	Plate, sheet, and strip, including military cups and discs do.	(D)	(D)		
335003	Other do.	(D)	(D)	(S)	1.1
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil mil lb.	(S)	6.3	(S)	3.0
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do.	(S)	1.3	(S)	3.5
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do.	(S)	.2	(S)	10.4
335006	Other nonferrous do.	(X)	(D)	(X)	(7)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons.	(D)	(D)	(S)	2.3
332045	Steel do.	(D)	(D)	(S)	11.3
336005	Aluminum and aluminum-base alloy mil lb.	(D)	(D)	(S)	9.3
336003	Other nonferrous do.	(D)	(D)	(S)	1.2
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous thousands.	(S)	2.2	(S)	12.7
362115	Fractional horsepower electric motors, excluding timing motors do.	1 480.7	13.1	(S)	27.4
362120	Integral horsepower motors and generators (1 hp or more) do.	(S)	.5	**10.3	1.8
	Bearings, including mounted and unmounted:				
356218	Ball do.	(X)	9.1	(X)	4.1
356201	Roller do.	(X)	9.1	(X)	3.6
344401	Sheet metal products, except stampings do.	(X)	10.2	(X)	26.1
345001	Bolts, nuts, screws, rivets, and screw machine products do.	(X)	9.6	(X)	11.0
346901	Metal stampings do.	(X)	13.0	(X)	26.3
360101	Electric transmission, distribution, and control equipment (including switchgear, fuses, transformers, relays, regulators, etc.) do.	(X)	49.9	(X)	59.1
364301	Appliance outlets, switches, lampholders, and other current- carrying wiring devices do.	(X)	5.1	(X)	16.1
367010	Electron tubes, except x-ray millions.	(D)	(D)	(S)	10.8
367408	Semiconductors	(X)	32.9	(X)	58.4
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors				
	Parts for computers and peripheral equipment:				
357002	For computers				
357201	For auxiliary storage equipment	(X)	249.4	(X)	219.2
357701	For input/output equipment				
357501	For computer terminals (excluding point-of-sale and funds- transfer devices)				
357003	For communication interface equipment				
357003	For other peripheral equipment				
260003	Paper and paperboard products, except paperboard boxes and containers	(X)	8.0	(X)	11.3

See footnotes at end of table.



**Table 7. Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3579, OFFICE MACHINES, N.E.C.— Con.</b>				
265001	Paperboard boxes and containers ..... 1,000 s tons..	(S)	8.3	(S)	10.7
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets .....	(X)	5.7	(X)	5.8
335792	Insulated wire and cable, except magnet wire (quantity of copper content)..... mil lb..	(S)	4.4	(S)	1.7
335770	Magnet wire .....	(D)	(D)	(S)	2.0
308006	Fabricated plastics products (except gaskets, hose, and belting) .....	(X)	20.3	(X)	39.0
970099	All other materials and components, parts, containers, and supplies.....	(X)	330.4	(X)	7458.6
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> .....	(X)	227.5	(X)	147.6

<sup>1</sup>For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: \* 10 to 19 percent estimated; \*\* 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

<sup>2</sup>Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

<sup>3</sup>Industry definition is new for 1987; therefore, 1987 data for materials consumed are not comparable to prior-year data. As a result, 1982 materials consumed data are not available.

<sup>4</sup>Based on discussions with respondents, a significant amount of printed circuit boards and other electronic-type devices were reported in the computer parts line (code 357002). These electronic devices should have been reported in material code 367002, "Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors." Electronic-type devices also were reported in the other parts categories shown (material codes 357210, 357701, 357501, 366130, and 357003). These categories were combined since major reporters were unable to separately classify their data according to the requested detail. The Census Bureau is working with the Computer and Business Equipment Manufacturers Association and other private and governmental organizations to improve the definitions of these categories and plans to introduce changes in future current industrial reports and censuses of manufactures.

<sup>5</sup>For 1987, material codes 331011, 331012, and 331017 are combined to avoid disclosing data for individual companies.

<sup>6</sup>Data are included with material code 970099 to avoid disclosing data for individual companies.

<sup>7</sup>For 1982, data for material code 335006 were not collected separately but included with material code 970099.

# APPENDIX A.

## Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

### SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

**Number of establishments and companies**—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

**Employment and related items**—The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

**All employees**—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods.

Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

**Production workers**—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

**All other employees**—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual



industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

**Payroll**—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

**Production-worker hours**—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

**Cost of materials**—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

**Specific materials consumed**—In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the introduction for the importance of administrative records in the industry.)

**Value of shipments**—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

**Individual products**—As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1987 census program, information was collected on the output of approximately 11,000 individual product items. The term "product", as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,600 of the product items were listed separately on the 1987 census report forms. Data for



about 4,400 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1987 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a-2).

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1982 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

**Classes of products**—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1987 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

**Duplication in cost of materials and value of shipments**—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the

addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the United States level and beginning in 1964, for all geographic levels.

**Value added by manufacture**—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

**New and used capital expenditures**—For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to



manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

**End-of-year inventories**—Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

## SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

1. **Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

**Specialization and coverage ratios**—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans.



They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

2. **Retirements of depreciable assets**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.
3. **Depreciation charges for fixed assets**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.
4. **Rental payments**—Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

5. **Depreciable assets**—Total value of gross depreciable assets is collected on all census forms.

However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

6. **New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)
7. **Quantity of electric energy consumed for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the ASM forms. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.
8. **Breakdown of new capital expenditures for machinery and equipment**—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement.



Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

9. **Foreign content of cost of materials**—Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.

10. **Cost of purchased services**—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding Census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed.

$$R_j = \frac{NMc}{TMEasm}$$

where:

NMc = the census value of new capital expenditures for machinery and equipment

TMEasm = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the three types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.



# **APPENDIX B.**

## **Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies**

### **DESCRIPTION OF SURVEY SAMPLE**

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 56,000 manufacturing establishments selected from a total of about 220,000 establishments. These 220,000 establishments represent all manufacturing establishments of multiunit companies and all single establishment companies mailed schedules in the 1982 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1982 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

The 1984 through 1988 ASM sample differs slightly from the previous sample. For the current panel, all establishments of companies with 1982 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 56,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1982 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1982 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1982 Census of Manufactures. Although this portion contained approximately 130,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

### **DESCRIPTION OF ESTIMATING PROCEDURES**

Most of the ASM estimates for the years 1983-1986 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1982 census published number for an item total and the linear ASM estimate of the total for 1982. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1983-1986. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.



The 1987 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates, however, developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

## QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.



# APPENDIX C.

## Changes in Census of Manufactures Product Classes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
30521	30411	30899 3089A	3079K pt	34919	34948	35483	36233
30522	30412	32295	32291 pt	34921	3494B	35484	35496
30523	30413	32296	32292 pt	34922	3494C	35485	35495 pt 35497
30524	30414	32297	32294 pt	34923	3494D	35533	35531 pt
30525	30415	32298	32291 pt 32292 pt 32294 pt	34924	3494E	35534	35532 pt
30526	30416	32311	32317	34925	3494F	35543	35541 35542 pt
30534	32934	32312	32317	34926	3494G	35544	35542 pt
30535	32935	32927	32928 32929	34927	3494H	35558	35557 pt
30536	32936	32961	32963 32965	3523C	35234 pt 35237 35238 pt	35561	35511
30537	32937	32962	32964 32966	3523E	35234 pt 35238 pt	35562	35512
30538	32938	33152	33152 34967	3523F	3523A 3523B	35563	35513 pt
30539	32939	33391	33331	35246	35243 35245	35591	35591 35699 pt
30611	3069A pt	33392	33334	3531A	35311	35596	35595 pt
30612	3069A pt	33398	33321 33323 33399	3531B	35312	35597	35494
30613	3069A pt	33561 33562 33563	33569	3531C	35317	35599	35595 pt 36360 36362
30614	3069B pt	33630	33611	3531E	35314 pt	35616	3561C
30615	3069B pt	33640	33620 pt 33691 pt 33692 pt 33693 pt	3531F	35316	35631	35631 pt
30616	3069B pt	34234	34232 pt	3531G	35318 pt	35651	35513 pt 35514 pt 35691 pt
30617	3069B pt	34235	34232 pt 35531 pt 35532 pt	3531H	35313 pt 35318 pt 35319 pt	35652	35513 pt 35514 pt 35691 pt
3069C	3069C 35557 pt	34236	34233	3531K	35319 pt 35361 pt 35371 pt	35676	35672
3069E	30310	34441 34443 34447 34448 34449	34446	3531M	35313 pt 35314 pt 35319 pt 35372 pt	35692	35694 35695 35696
30810	30792	34461 34462 34463 34464 34465	34460	35337	35331 35332 pt	35697 35698	35699 pt
30820	3079K pt	34911 34912 34913 34914 34915 34916	3494A	35338	35332 pt	35711	35731 36629 pt
30830	3079K pt	34917	34949	35339	35333	35712	35734 pt 35735 pt
30840	30794	34918	34947	3533A	35335	35721	35732 pt
30840	30794	34919	34948	3533B	35336	35722	35734 pt 35735 pt
30850	30795	34921	3494B	35363	35361 pt	35751	35732 pt 36612 pt
30861 30862 30863 30864 30865 30866	30797	34922	3494C	35364	35362 pt	35752	35734 pt 35735 pt
30870	3079K pt	34923	3494D	35373	35362 pt 35371 pt	35771	35732 pt
30880	3079J pt 3079K pt	34924	3494E	35374	35362 pt 35372 pt	35772	35734 pt 35735 pt
30891	3079J pt 3079K pt	34925	3494F	3541D	35411 35412	35781	35743
30892	3079J pt 3079K pt	34926	3494G	35430	35650	35782	35744
30893	3079J pt 3079K pt	34927	3494H	35454	35453	35783	35745
30894	3079J pt 3079K pt	34928	34949	35455	35452	3585C	3585A 36993
30895	3079J pt	34929	34950	35481	36231	3585D	3585B 36994 pt
30896	2499A pt 3079J pt 3079K pt	34930	34951	35482	36232		



[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
35931	35996 35997	36411	36410	36991—Con. 36995	36629 pt—Con.	38731—Con.	38734—Con. 38736 38737
35932	35998	36412	36994 pt	36997	35497 pt 36629 pt	39113 39114	39112
35933	35999	36520	36521 pt	36998	36994 pt	39153 39154	39151
35941	35617 35618 35631 pt	36613	35732 pt 36612 pt	3714A	37143	39447	36629 pt 39447
35942	3561A 3561B 35631 pt	36614	36612 pt	37999	37994 37998	39493	39494 pt
35961 35962 35963	35760	36631	36621 36629 pt	38121	38111	39495	3079k pt
36123 36126	36125	36632	36622	38122	36625 pt 36629	39496	39494 pt
36251	36138 pt 36794	36691	36624	38210	38112 38113 pt	39523	39521 39522 pt
36252	36221	36692	36626	38260	38320 38326	39524	39522 pt
36253	36222	36693	36628	38271	38324	39651	39630
36254	36138 pt 36223	36714	36711 36712	38272 38273	38325	39654	39641
36330	36331 36333	36715	36799 pt	38295	36625 pt 38293	39656	39642
36395	36361 36394 36399	36720	36797	38296	38113 pt	39998	39620
		36799	36629 pt 36799 pt	38440	36931	39999	39995
		36950	35732 pt 36792	38450	36930 36933	97372	36522
		36991 36992	36629 pt	38731	38734	97819	36521 pt

# APPENDIX D.

## Changes in Census of Manufactures Product Codes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
30118 00	30118 00	30118 19 30118 20	30539 77	32939 77	32939 77	30830 11 30830 13 30830 19	30793 01 30793 03 30793 09	3079K 90	30892 20— Con.	3079D 33— Con.	3079J 61 pt —Con. 3079J 66 pt 3079K 93 pt
3011A 39	3011A 39	3011A 33 3011A 35	30539 79	32939 79	32939 79	30840 11	30794 21	30794 21			
3011C 29	3011C 29	3011C 24 3011C 26 3011C 27	30611 00	3069A 00	3069A 11	30840 12	30794 22	30794 22	30892 30	3079D 35	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30521 00	30411 00	30411 00	30612 00	3069A 00	3069A 12 3069A 15	30840 13	30794 23	30794 23			
30522 00	30412 00	30412 00	30613 00	3069A 00	3069A 13 3069A 14 3069A 16	30840 14	30794 24	30794 24			
30523 00	30413 00	30413 00	30614 00	3069B 00	3069B 11	30840 15	30794 25	30794 25	30892 90	3079D 39	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30524 00	30414 00	30414 00	30615 00	3069B 00	3069B 12 3069B 13 3069B 14 3069B 19	30840 19	30794 26	30794 26			
30525 00	30415 00	30415 00				30850 00	30795 00	30795 00			
30526 00	30416 00	30416 00				30861 00	30797 41	30797 41			
30534 11	32934 11	32934 11	30616 00	3069B 00	3069B 21	30862 10 30862 20 30862 90	30797 51 30797 53 30797 59	30797 42	30893 00	3079F 22	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30534 13	32934 13	32934 13	30617 00	3069B 00	3069B 29	30863 10 30863 90	30797 61 30797 69	30797 44			
30534 15	32934 15	32934 15	30697 77	30697 77	30697 11 30697 78	30864 10 30864 20 30864 30 30864 90	30797 71 30797 73 30797 75 30797 79	30797 45	30894 01	30798 01	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30534 17	32934 17	32934 17	3069C 12	35558 72	35557 72	30865 10 30865 20 30865 30 30865 40 30865 90	30797 81 30797 83 30797 85 30797 86 30797 89	30797 46			
30535 11	32935 11	32935 11	3069C 30	35558 76	35557 76	30866 10	30797 43	30797 43	30894 02	30798 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 13	32935 13	32935 13	3069D 20	3069D 20	3069D 17 3069D 19	30866 90	30797 47	30797 47			
30535 15	32935 15	32935 15	3069D 42	3069D 42	3069D 55 3069D 58	30870 12 30870 13	30791 01 30791 02	3079K 99	30894 03	30798 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 17	32935 17	32935 17	3069E 20	30310 00	30310 00	30880 00	3079F 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 04	30798 04	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 19	32935 19	32935 19	30810 10	30792 11	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 01	3079C 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 05	30798 05	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 21	32935 21	32935 21	30810 20	30792 12	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 03	3079C 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 06	30798 06	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 23	32935 23	32935 23	30810 30	30792 13	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 09	3079C 19	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 07	30798 07	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 29	32935 29	32935 29				30892 10	3079D 31	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 09	30798 09	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30536 21	32936 21	32936 21				30892 20	3079D 33	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt	30895 01	30799 01	3079J 61 pt
30536 22	32936 22	32936 22									
30536 25	32936 25	32936 25									
30536 26	32936 26	32936 26									
30536 30	32936 30	32936 30									
30536 35	32936 35	32936 35									
30537 29	32937 29	32937 29									
30537 39	32937 39	32937 39									
30537 41	32937 41	32937 41									
30537 43	32937 43	32937 43									
30537 49	32937 49	32937 49									
30538 10	32938 10	32938 10									
30538 13	32938 13	32938 13									
30538 15	32938 15	32938 15									
30538 17	32938 17	32938 17									
30538 19	32938 19	32938 19									
30539 70	32939 70	32939 70									
30539 73	32939 73	32939 73									
30539 75	32939 75	32939 75									



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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
30895 01— Con.	30799 01— Con.	3079J 61 pt —Con. 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 22— Con.	3079A 21— Con.	3079J 61 pt —Con. 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 05— Con.	3079B 25— Con.	3079J 61 pt —Con. 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 15	32927 15	32929 11 32929 21
									32927 31	32927 31	32929 31
									32927 33	32927 33	32929 33
30895 02	30799 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 23	3079A 23	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 06	3079B 26	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 34	32927 34	32929 34
									32927 36	32927 36	32929 36
									32927 41	32927 41	32929 41
30895 03	30799 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt							32927 77	32927 77	32929 77
			30896 24	3079A 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 07	3079B 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 78	32927 78	32929 51 32929 73 32929 75
									32927 98	32927 98	32928 13 32929 98
30896 11	3079A 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				30898 08	3079B 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32961 11	32961 11	32963 11 32965 11
			30896 25	3079A 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				32961 31	32961 31	32963 31 32965 31
30896 12	3079A 12	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt							32961 35	32961 35	32963 35 32965 35
			30896 26	3079A 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 09	3079B 29	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3179K 99	32961 38	32961 38	32963 38 32965 38
30896 13	3079A 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt							32961 51	32961 51	32963 51 32965 51
			30896 27	2499A 94 3079A 29	2499A 94 3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				32961 61	32961 61	32963 61 32965 61
						30899 00	3079F 31	3079K 88	32961 98	32961 98	32963 98 32965 98
30896 14	3079A 14	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				3089A 11	3079F 41	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 31	32962 31	32964 31 32966 31
			30897 01	3079F 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 12	3079F 43	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 34	32962 34	32964 34 32966 34
30896 15	3079A 15	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt							32962 36	32962 36	32964 36 32966 36
			30897 09	3079F 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 14	3079F 47	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 45	32962 45	32964 45 32966 45
30896 16	3079A 16	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				3089A 18	3079F 49	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 61	32962 61	32964 61 32966 61
			30898 01	3079B 21	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	32295 00	32295 00	32291 00 pt	32962 83	32962 83	32964 83 32966 83
30896 17	3079A 17	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				32296 00	32296 00	32292 00 pt	32962 98	32962 98	32964 98 32966 98
						32297 00	32297 00	32294 00 pt			
						32298 00	32298 00	32291 00 pt 32292 00 pt 32294 00 pt	33121 98	33121 98	33121 79 33121 85 33121 98
30896 18	3079A 18	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 02	3079B 22	3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32311 00	32311 00	32317 00	3312A 11 3312A 23 3312A 25 3312A 27	3312A 11 3312A 23 3312A 25 3312A 27	3312A 00
						32620 15	32620 15	32620 14 32620 52 pt			
			30898 03	3079B 23	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32620 19	32620 19	32620 18 32620 52 pt	3312B 61 3312B 63 3312B 65 3312B 67	3312B 61 3312B 63 3312B 65 3312B 67	3312B 00
30896 19	3079A 19	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				32630 15	32630 15	32630 14 32630 52 pt	33151 22 33151 23	33151 22 33151 23	33151 21
			30898 04	3079B 24	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32630 19	32630 19	32630 18 32630 52 pt	33152 01	33152 01	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt
30896 21	3079A 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt				32752 11	32752 11	32752 00			
						32917 23	32917 23	32917 22 32917 24			
						32917 40	32917 40	32917 26 32917 28 32917 39	33152 03	33152 03	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 17 pt
30896 22	3079A 21	3079J 61 pt 3079J 62 pt	30898 05	3079B 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt	32927 14	32927 14	32928 15 32928 17			



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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
33152 03— Con.	33152 03— Con.	33152 11 pt —Con. 34967 19 pt	33157 42— Con.	33157 42— Con.	33157 31 pt —Con. 33157 71 pt	33561 66— Con. 33562 78 33563 91 33569 91	33561 66— Con. 33562 78 33563 91 33569 91	33569 92— Con.	34236 21	34236 21	34233 21
33152 05	33152 05	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 13 pt 34967 17 pt 34967 19 pt	33157 43	33157 43	33157 31 pt 33157 61 pt 33157 71 pt	33630 00	33611 00	33611 00	34236 31	34236 31	34233 31
			33159 44 33159 45 33159 48	33159 44 33159 45 33159 48	33159 49	33640 11	33620 42	33620 42	34236 41	34236 41	34233 41
						33640 21	33691 51	33691 51	34236 81	34236 81	34238 81
33152 07	33152 07	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33159 99	33159 99	33159 77 33159 98	33640 31	33692 31	33692 31	34236 99	34236 99	34233 99
			33211 21	33211 21	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33640 41	33693 71	33693 71	34292 12 34298 99	34292 12 34298 99	34298 98
						33640 51	33693 91	33693 91	34320 01 34320 03	34320 01 34320 03	34320 04
			33211 23	33211 23	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33650 11	33612 11	33612 11	34320 05 34320 07	34320 05 34320 07	34320 06
33152 09	33152 09	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 25	33211 25	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33650 31	33612 31	33612 31	34320 09 34320 11	34320 09 34320 11	34320 08
						33650 51	33612 51	33612 51	34320 14 34320 25 34320 35	34320 14 34320 25 34320 35	34320 98
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			33217 31	33217 31	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 20	33620 20	33620 20	34320 67 34320 69	34320 67 34320 69	34320 65
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						33660 22	33620 22	33620 22	34320 76 34320 78	34320 76 34320 78	34320 77
			33217 35	33217 35	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 23	33620 23	33620 23	34320 80 34320 82	34320 80 34320 82	34320 55
						33660 24	33620 24	33620 24	34320 84 34320 86	34320 84 34320 86	34320 56
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			33391 00	33331 00	33331 00	33690 11	33692 11	33692 11	34320 94 34320 95	34320 94 34320 95	34320 43
			33392 31	33334 31	33334 31	33690 15	33692 11	33692 11	34320 96 34320 97	34320 96 34320 97	34320 44
			33392 37	33334 37	33334 35 pt	33690 21	33692 33	33692 33	34320 99	34320 99	34320 98 pt
33152 22	33152 22	33152 33 pt 34967 23 pt	33392 39	33334 39	33334 38 pt	33690 25	33692 41	33692 41	34432 44	34432 44	34432 45
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33152 23	33152 23	33152 23 34967 19 pt	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34432 52 34432 54 34432 56 34432 98	34432 52 34432 54 34432 56 34432 98	34432 99
33152 25	33152 25	33152 25 34967 21	33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 13	34433 13	34433 12 34433 14 34433 48 pt
33152 30	33152 30	33152 33 pt 34967 23 pt	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 17	34433 17	34433 16 34433 18 34433 48 pt
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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
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34438 17 34438 19	34438 17 34438 19	34438 18	34465 12	34465 12	34460 56 pt	34914 17	3494A 54	3494A 54	34964 41	34964 41	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
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34461 10	34461 10	34460 07	34912 31	3494A 26	3494A 26	34921 00	3494B 00	3494B 00			
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34461 15	34461 15	34460 12	34912 41	3494A 28	3494A 28	34923 00	3494D 00	3494D 00			
34461 17	34461 17	34460 17	34912 43	3494A 29	3494A 29	34924 00	3494E 00	3494E 00			
34462 10	34462 10	34460 31	34912 45	3494A 30	3494A 30	34925 00	3494F 00	3494F 00			
34462 12	34462 12	34460 36	34913 11	3494A 31	3494A 31	34926 00	3494G 00	3494G 00			
34462 22	34462 22	34460 22	34913 23	3494A 32	3494A 32	34927 00	3494H 00	3494H 00			
34462 26	34462 26	34460 51									
34463 10	34463 10	34460 41									



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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
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35112 76	35112 76	35112 75 pt 35112 77	3531F 00	3531F 00	35316 00	35337 24 35337 25	35337 24 35337 25	35331 46	35364 04	35364 04	35362 11 35362 15 pt
35112 79 35112 83	35112 79 35112 83	35112 00 pt	3531G 00	3531G 00	35318 00 pt	35337 26 35337 27	35337 26 35337 27	35331 43	35364 05	35364 05	35362 13 35362 15 pt
35199 01	35199 01	35199 98 pt	3531H 00	3531H 00	35313 00 pt 35318 00 pt 35319 85	35337 44	35337 44	35331 44	35364 06	35364 06	35362 14 35362 15 pt
35199 33	35199 26	35199 26	3531K 06	3531K 06	35319 06	35337 45	35337 45	35331 45	35364 17	35364 17	35362 55 pt
35199 41 35199 42	35199 41 35199 42	35199 03	3531K 07	3531K 07	35319 07	35337 47	35337 47	35331 47	35364 52	35364 52	35362 52
35199 43 35199 44	35199 43 35199 44	35199 04	3531K 11	3531K 11	35319 11	35337 48	35337 48	35331 48	35364 54	35364 54	35362 55 pt
35199 45 35199 46	35199 45 35199 46	35199 05	3531K 20	3531K 20	35319 20	35337 59	35337 59	35331 59	35373 01 35373 02	35373 01 35373 02	35371 23 pt
35199 47	35199 47	35199 06 pt 35199 07 pt	3531K 21	3531K 21	35319 21	35337 61	35337 61	35332 61 pt	35373 03	35373 03	35371 11 pt
35199 48	35199 48	35199 06 pt 35199 07 pt	3531K 22 3531K 24	3531K 22 3531K 24	35319 23	35338 31	35338 31	35332 31	35373 05	35373 05	35371 36 pt 35371 37 pt 35371 38 pt
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35199 53 35199 54	35199 53 35199 54	35199 15	3531K 27	3531K 27	35319 27	35338 98	35338 98	35332 98	35373 08	35373 08	35371 11 pt
35199 55 35199 56	35199 55 35199 56	35199 16	3531K 53 3531K 55	3531K 53 3531K 55	35319 52	35338 99	35338 99	35332 61 pt	35373 12	35373 12	35371 61
35199 57 35199 58	35199 57 35199 58	35199 17	3531K 61	35363 36	35361 36	35339 12	35339 12	35333 12	35373 15	35373 15	35371 23 pt 35371 41 pt
35199 59 35199 60	35199 59 35199 60	35199 18	3531K 70	3531K 70	35319 70	35339 13	35339 13	35333 13	35373 16	35373 16	35371 11 pt
35199 61 35199 62	35199 61 35199 62	35199 19	3531K 74	3531K 74	35319 72 35319 73	35339 14	35339 14	35333 14	35373 17	35373 17	35371 36 pt 35371 37 pt 35371 38 pt 35371 41 pt
35199 91	35199 91	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531K 77	3531K 77	35319 75 35319 76	35339 19	35339 19	35333 19	35373 18	35373 18	35371 11 pt
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35239 26	35239 26	35239 21 35239 25	3531K 90	3531K 40 35373 90	35319 41 35371 91 35371 93	35339 53	35339 53	35333 53	35373 21	35373 21	35371 55
35239 31	35239 31	35239 01 35239 02 35239 03 35239 04 35239 05 35239 06 35239 07 35239 08 35239 09 35239 11 35239 12 35239 19 35239 30	3531K 97	3531K 97	35319 97	35339 55	35339 55	35333 55	35373 25	35373 25	35371 99 pt
35239 53	35239 53	35239 50 35239 51	3531M 01	3531M 01	35313 00 pt	35339 57	35339 57	35333 57	35373 26	35373 26	35371 75
3523C 00	3523C 00	35234 00 pt 35237 00 35238 00 pt	3531M 03	3531M 03	35314 00 pt	35339 61	35339 61	35333 61	35373 28	35373 28	35371 81
3523E 00	3523E 00	35234 00 pt 35238 00 pt	3531M 05	3531M 05	35319 84 pt 35319 86 pt	35339 65	35339 65	35333 65	35373 29	35373 29	35371 83
3523F 00	3523F 00	3523A 00 3523B 00	3531M 07	3531M 07	35319 84 pt 35319 86 pt	35339 71	35339 71	35333 71	35373 31	35373 31	35371 71
35246 00	35246 00	35243 00 35245 00	3531M 09	3531M 09	35319 84 pt 35319 86 pt	35339 82	35339 82	35333 82	35373 32	35373 32	35371 85
3531A 00	3531A 00	35311 00	3531M 15	3531M 19	35319 84 pt 35319 86 pt 35374 15 35372 85 pt	35339 88	35339 88	35333 88	35373 35	35364 41	35362 41
3531B 00	3531B 00	35312 00	35329 33	35329 33	35329 31 pt 35329 35 pt	35339 98	35339 98	35333 98	35373 39	35373 39	35371 48 35371 99 pt
3531C 00	3531C 00	35317 10 35317 20 35317 30	35329 34	35329 34	35329 31 pt 35329 35 pt	3533A 10	3533A 10	35335 10	35374 11	35374 11	35372 11
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			35337 15	35337 15	35331 15	35363 13	35363 13	35361 13	35421 00	35421 00	35421 10 35421 20
			35337 16	35337 16	35331 16	35363 15	35363 15	35361 14	35424 01 35424 02	35424 01 35424 02	35424 11
			35337 17	35337 17	35331 17	35363 16	35363 16	35361 16	35424 03 35424 04 35424 05	35424 03 35424 04 35424 05	35424 75
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35454 12	35454 12	35453 12	35481 09	36231 54	36231 54						
			35481 11	36231 56	36231 56	35521 54 35521 56	35521 54 35521 56	35521 55	35543 23	35543 23	35541 53 35542 73 pt
35454 14	35454 14	35453 14	35481 12	36231 57	36231 57	35521 68 35521 69	35521 68 35521 69	35521 67	35543 24	35543 24	35541 54 pt 35541 59 pt 35542 73 pt
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35454 43	35454 43	35453 43	35482 06	36232 31	36232 31	35533 19	35533 19	35531 62	35544 03	35544 03	35542 85
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35454 51	35454 51	35453 51	35482 08	36232 45	36232 59 pt 36232 64 pt 36232 68 pt	35533 25 35533 27	35533 25 35533 27	35531 75 pt	35544 05	35544 05	35542 87
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35454 98	35454 98	35453 98	35482 12	36232 54	36232 54	35533 31	35533 31	35531 73 pt	35553 05	35553 05	35553 01 35553 02 35553 04
35455 11	35455 11	35452 11	35482 13	36232 55	36232 55	35533 35 35533 37	35533 35 35533 37	35531 98 pt	35553 08	35553 08	35553 11 35553 12
35455 13	35455 13	35452 13	35482 14	36232 58	36232 58	35533 39	35533 39	35531 17 35531 73 pt 35531 75 pt 35531 98 pt	35553 09	35553 09	35553 45 35553 52 35553 57
35455 15	35455 15	35452 15	35482 15	36232 62	36232 61 36232 65				35558 02	35558 02	35557 01
35455 17	35455 17	35452 17	35482 16	36232 66	36232 64 pt 36232 68 pt	35533 87	35533 87	35531 87	35558 09	35558 09	
35455 21	35455 21	35452 21	35483 05	36233 13	36233 13	35534 01 35534 02 35534 03	35534 01 35534 02 35534 03	35532 21	35558 69	35558 69	35557 69
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35455 65	35455 65	35452 65	35483 07	36233 31	36233 31	35534 11	35534 11	35532 81 pt	35558 85	35558 85	35557 85
35455 71	35455 71	35452 71	35483 08	36233 52	36233 52	35543 01	35543 01	35541 11 35542 73 pt	35558 87	35558 87	35557 87
35455 81 35455 83	35455 81 35455 83	35452 99 pt	35483 09	36233 61	36233 61				35558 89	35558 89	35557 89
35455 91 35455 92	35455 91 35455 92	35452 92	35484 01	35496 01	35496 01	35543 02	35543 02	35541 21 35541 27 35542 73 pt	35558 99	35558 99	35557 99
35455 93	35455 93	35452 99 pt	35484 02	35496 05	35496 05				35561 02	35511 02	35511 41 pt 35511 99 pt
35455 94	35455 94	35452 94	35484 03	35496 09	35496 09				35561 05	35511 05	35511 73
35455 95	35455 95	35452 95	35484 04	35496 15	35496 15				35561 06	35511 06	35511 83
35455 96 35455 97 35455 98	35455 96 35455 97 35455 98	35452 99 pt	35484 05	35496 17	35496 17						



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35561 07	35511 07	35511 91	35593 01	35593 11	35593 11	35599 13	35599 13	35595 41 pt 35595 98 pt	35616 00	35616 00	3561C 00
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35561 09	35511 09	35511 41 pt	35593 05	35593 32	35593 32	35599 17	35599 17	35595 41 pt 35595 98 pt	35646 10 35646 20	35646 10 35646 20	35646 00
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35562 21	35512 21	35512 21	35593 13	35593 13	35593 53 35593 54	35599 25	35599 25	35595 41 pt 35595 98 pt	35651 03	35514 26 35691 26	35514 26 35691 26
35562 31	35512 31	35512 31	35593 15	35593 61	35593 61	35599 27 35599 29	35599 27 35599 29	35595 41 pt	35651 04	35514 29 35691 29	35514 29 35691 29
35562 41	35512 41	35512 41	35593 17	35593 71	35593 71	35599 31 35599 33	35599 31 35599 33	35595 45	35651 05	35514 30 35691 30	35514 30 35691 30
35562 51	35512 51	35512 51	35593 19	35593 72	35593 72	35599 35 35599 37	35599 35 35599 37	35595 49	35651 06	35514 32 35691 32	35514 32 35691 32
35562 65	35512 65	35512 61 35512 92 pt	35593 21 35593 23 35593 25	35593 21 35593 23 35593 25	35593 79	35599 39 35599 41	35599 39 35599 41	35595 43	35651 07	35514 33 35691 33	35514 33 35691 33
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35562 75	35512 75	35512 75	35594 01	35594 11	35594 11	35599 47	35599 47	35595 85 pt	35651 09	35514 41 35691 41	35514 41 35691 41
35562 85	35512 85	35512 92 pt	35594 03	35594 31	35594 31	35599 49 35599 51	35599 49 35599 51	35595 98 pt	35651 11	35514 52 35691 52	35514 52 35691 52
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35563 01	35513 01	35513 59 pt	35594 07	35594 71	35594 71	35599 57 35599 59	35599 57 35599 59	35595 92	35651 13	35514 54 35691 54	35514 54 35691 54
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35591 07	35591 07 35698 33	35591 00 pt 35699 97 pt	35599 05 35599 07	35599 05 35599 07	35595 21	35599 99	35599 99	35595 88 35595 98 pt	35675 01	35675 01	35675 51
35591 09 35591 11	35591 09 35591 11	35591 00 pt	35599 09 35599 11	35599 09 35599 11	35595 32	35675 02 35675 03	35675 02 35675 03	35675 59	35675 11 35675 12	35675 11 35675 12	35675 91
35591 13	35591 13 35698 34	35591 00 pt 35699 97 pt	35599 09 35599 11	35599 09 35599 11	35595 32	35676 00	35676 00	35676 00 pt	35676 01	35676 01	35676 11
35591 15	35591 15	35591 00 pt	35599 09 35599 11	35599 09 35599 11	35595 32						
35592 01	35592 21	35592 21									
35592 03	35592 33	35592 33									
35592 05	35592 35	35592 35									
35592 07	35592 54	35592 54									
35592 09 35592 11	35592 09 35592 11	35592 98 pt									
35592 15	35592 15	35592 41 35592 42 35592 98 pt									
35592 19	35592 97	35592 97									



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35676 02	35676 02	35672 21	35751 00	35732 40 36612 10	35732 00 pt 36612 00 pt	35892 98	35892 98	35892 89 pt	35963 03	35763 03	35760 62
35676 03	35676 03	35672 61		35892 99	35892 99	35892 93 pt	35963 05	35763 05	35760 63		
35676 04	35676 04	35672 00 pt	35752 00	35733 40	35734 30 pt 35735 51 pt	35893 01 35893 02	35893 01 35893 02	35893 11	35963 09	35763 09	35760 84
35676 05	35676 05	35672 41 pt	35771 00	35732 30 35732 61	35732 00 pt	35893 08 35893 09	35893 08 35893 09	35893 98	36122 02 36122 04 36122 06	36122 02 36122 04 36122 06	36122 00
35676 06	35676 06	35672 00 pt	35772 00	35733 30 35733 60	35734 30 pt 35735 51 pt 35734 30 pt 35735 51 pt				36122 14 36122 16 36122 19	36122 14 36122 16 36122 19	
35676 17 35676 19	35676 17 35676 19	35672 41 pt				35921 01	35921 01	35921 11	36122 21 36122 23 36122 28 36122 29	36122 21 36122 23 36122 28 36122 29	
35681 11 35681 13	35681 11 35681 13	35681 15	35781 00	35743 00	35743 00	35921 02	35921 02	35921 13	36122 32 36122 33 36122 37 36122 39 36122 41 36122 42 36122 43 36122 44	36122 32 36122 33 36122 37 36122 39 36122 41 36122 42 36122 43 36122 44	36125 00 pt
35683 36 35683 93 35683 95	35683 36 35683 93 35683 95	35683 99 pt				35921 03	35921 03	35921 71			
35683 98	35683 98	35683 91 35683 99 pt	35782 00	35744 00	35744 00	35921 05	35921 05	35921 72	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36125 00 pt
			35783 00	35745 00	35745 10 35745 31	35922 01	35922 01	35922 21			
35692 00	35692 00	35694 00 35695 00 35696 00	3579A 00	3579A 00	3579A 20 3579A 40 3579A 41 3579A 44 3579A 50 3579A 55	35922 02	35922 02	35922 23	36127 11 36127 31 36127 78	36127 11 36127 31 36127 78	36127 00
			35820 35 35820 36	35820 35 35820 36	35820 24	35922 03	35922 03	35922 51			
35693 04	35693 04	35693 01 pt 35693 02 pt 35693 03 pt	35856 00	35856 00	35856 11 35856 30	35922 04	35922 04	35922 53	36127 11 36127 31 36127 78	36127 11 36127 31 36127 78	36127 00
35693 05	35693 05	35693 01 pt 35693 02 pt 35693 03 pt				35922 05	35922 05	35922 55			
35693 06	35693 06	35693 01 pt 35693 02 pt 35693 03 pt	35859 05 35859 07	35859 05 35859 07	35859 09	35922 06	35922 06	35922 57	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36125 00 pt
			3585C 00	3585A 10 3585A 20 36993 00	3585A 10 3585A 20 36993 00	35923 01	35923 01	35923 61			
35697 00	35697 00	35699 97 pt	3585D 10	3585B 10	3585B 10	35923 02	35923 02	35923 63	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36125 00 pt
35698 01 35698 02	35698 01 35698 02	35699 31	3585D 20	3585B 20	3585B 20	35931 00	35991 00	35996 00 35997 00			
35698 03 35698 04	35698 03 35698 04	35699 32	3585D 30	3585B 30	3585B 30	35932 00	35998 00	35998 00	36127 11 36127 31 36127 78	36127 11 36127 31 36127 78	36127 00
35698 05 35698 06	35698 05 35698 06	35699 33	3585D 40	3585B 40	3585B 40	35933 00	35999 00	35999 00	36249 94 36249 96	36249 94 36249 96	36249 98
35698 07 35698 08	35698 07 35698 08	35699 35	3585D 50	3585B 50	3585B 50	35941 10	35619 00	35617 00 35618 00	36251 00	36138 10 36794 00	36138 00 pt 36794 00
35698 11 35698 12	35698 11 35698 12	35699 36	3585D 60	3585B 60	3585B 60	35941 20	35631 50	35631 40 pt	36252 00	36221 00	36221 00
35698 13 35698 14	35698 13 35698 14	35699 41	3585D 70	3585B 70	3585B 70	35942 10	3561D 00	3561A 00 3561B 00	36253 00	36222 00	36222 00
35698 15 35698 16	35698 15 35698 16	35699 43	3585D 80	3585B 72 36994 07	3585B 72 36994 07	35942 20	35631 60	35631 40 pt	36254 00	36138 20 36223 00	36138 00 pt 36223 00
35698 17 35698 18	35698 17 35698 18	35699 45	35860 89	35860 89	35860 21 35860 41 35860 88	35961 01	35761 01	35760 13	36291 01	36291 11	36291 11
35698 19 35698 20	35698 19 35698 20	35699 47	35892 03	35892 03	35892 01 pt	35961 03	35761 03	35760 15	36291 05	36291 31	36291 31
			35892 04 35892 05	35892 04 35892 05	35892 02 pt	35961 05	35761 05	35760 21	36291 07	36291 35 36291 98 pt	
35698 21 35698 22	35698 21 35698 22	35699 51	35892 06	35892 06	35892 01 pt 35892 02 pt	35961 07	35761 07	35760 23	36291 09	36291 09	36291 98 pt
35698 23 35698 24	35698 23 35698 24	35699 61	35892 07	35892 07	35892 93 pt	35961 09	35761 09	35760 24	36293 01	36293 01	36293 13 36293 15
35698 25 35698 26	35698 25 35698 26	35699 71	35892 08	35892 08	35892 09	35961 11	35761 11	35760 26	36293 02	36293 31	36293 31
35698 27 35698 28	35698 27 35698 28	35699 73	35892 09	35892 09	35892 25 35892 28	35961 13	35761 13	35760 28	36293 03	36293 03	36293 99
35698 31 35698 32	35698 31 35698 32	35699 74	35892 27	35892 27	35892 93 pt	35962 01	35762 01	35760 32	36293 04 36293 05 36293 09	36293 04 36293 05 36293 09	36311 00
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35698 35 35698 36 35698 48 35698 49	35698 35 35698 36 35698 48 35698 49	35699 97 pt	35892 44	35892 44	35892 89 pt	35962 05	35762 05	35760 36	36313 10 36313 20	36313 10 36313 20	36313 00
35711 00	35731 00 36629 43	35731 00 36629 00 pt	35892 45 35892 76	35892 45 35892 76	35892 93 pt	35962 07	35762 07	35760 37 pt	36314 10 36314 20	36314 10 36314 20	36314 00
			35892 77 35892 78 35892 79	35892 77 35892 78 35892 79	35892 84	35962 11	35762 11	35760 45	36330 10	36330 10	36331 00 36333 11 36333 15 36333 71
35712 00	35733 05	35734 20 35735 41	35892 80	35892 80	35892 93 pt	35962 13	35762 13	35760 52	36330 20	36330 20	36333 95
35721 00	35732 10	35732 00 pt	35892 85 35892 87 35892 88	35892 85 35892 87 35892 88	35892 86	35962 15	35762 15	35760 53			
35722 00	35733 10	35734 30 pt 35735 51 pt	35892 89	35892 89	35892 93 pt	35962 17 35962 19	35762 17 35762 19	35760 37 pt	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89



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36395 20	36361 84 36395 40	36361 84 36394 00 pt 36399 91 36399 93	36920 07	36920 07	36920 10 pt 36920 70 pt 36920 82 pt 36920 92 pt	37112 03	37112 03	37112 11 pt 37112 13 pt	37131 11	37131 40	37131 40
36411 00	36410 10	36410 20 36410 55 36410 63	36920 09	36920 09	36920 95	37112 04	37112 04	37112 11 pt 37112 13 pt 37112 15 pt	37131 13	37131 13	37131 42 37131 46
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36489 12	36489 12	36489 11 pt 36489 19 pt	36941 02	36941 02	36941 16	37112 06	37112 06	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 16	37131 50	37131 50
36489 16	36489 16	36489 11 pt	36941 03	36941 03	36941 31	37112 07	37112 07	37112 11 pt 37112 13 pt 37112 15 pt	37131 17	37131 52	37131 52
36489 17	36489 17	36489 19 pt	36941 04	36941 04	36941 35	37112 08	37112 08	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 21	37131 37	37131 37
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36614 00	36612 40	36612 00 pt	36947 04 36947 05	36947 04 36947 05	36947 03	37112 17	37112 17	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 69	37131 69	37131 60 pt
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36632 00	36622 00	36622 00	36949 11	36949 11	36949 02	37112 19	37112 19	37112 11 pt 37112 13 pt 37112 15 pt	37132 02	37132 02	37132 71 37132 75
36691 00	36624 00	36624 00	36949 12	36949 12	36949 03 36949 04	37112 20	37112 20	37112 11 pt 37112 13 pt 37112 15 pt	37132 03	37132 03	37132 98 pt
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36693 00	36628 00	36628 00	36949 19	36949 19	36949 09 pt	37112 22	37112 22	37112 11 pt 37112 13 pt 37112 15 pt	37132 06	37132 06	37132 06
36714 00	36714 00	36711 00 36712 00	36950 00	35732 20 36792 00	35732 00 pt 36792 00	37112 23	37112 23	37112 11 pt 37112 13 pt 37112 15 pt	37132 07	37132 07	37132 07
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36914 25	36914 25	36914 21 36914 29	36998 02	36994 71	36994 71	37112 29	37112 29	37112 11 pt 37112 13 pt 37112 15 pt	37132 18	37132 18	37132 18
36915 01	36915 01	36915 72 36915 75	36998 03	36994 72	36994 96 pt	37112 30	37112 30	37112 11 pt 37112 13 pt 37112 15 pt	37132 19	37132 19	37132 19
36915 02	36915 02	36915 85	36998 04	36994 82	36994 82	37112 31	37112 31	37112 11 pt 37112 13 pt 37112 15 pt	37132 21	37132 21	37132 21
36920 01	36920 01	36920 10 pt 36920 70 pt 36920 82 pt	36998 05	36994 83	36994 83	37112 32	37112 32	37112 11 pt 37112 13 pt 37112 15 pt	37132 25	37132 77	37132 77
36920 03	36920 03	36920 70 pt 36920 82 pt	36998 06	36994 84	36994 84	37112 33	37112 33	37112 11 pt 37112 13 pt 37112 15 pt	37132 26	37132 26	37132 98 pt
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			36998 09	36994 85	36994 85	37112 36	37112 36	37112 11 pt 37112 13 pt 37112 15 pt	37132 29	37132 29	37132 29
			36998 19	36994 97	36994 81 36994 96 pt	37112 37	37112 37	37112 11 pt 37112 13 pt 37112 15 pt	37132 31	37132 31	37132 31
			37112 01	37112 01	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37112 38	37112 38	37112 11 pt 37112 13 pt 37112 15 pt	37142 48	37142 48	37142 03 37142 04 37142 05 37142 22 37142 33 37142 37 37142 49
			37112 02	37112 02	37112 23 pt 37112 25 pt	37112 39	37112 39	37112 11 pt 37112 13 pt 37112 15 pt	37144 09	37144 09	37144 11 37144 13
						37112 40	37112 40	37112 11 pt 37112 13 pt 37112 15 pt	37146 03	37146 03	37146 01 37146 02
						37112 41	37112 41	37112 11 pt 37112 13 pt 37112 15 pt	37146 49	37146 49	37146 19 37146 21 37146 39
						37112 42	37112 42	37112 11 pt 37112 13 pt 37112 15 pt	37147 07	37147 07	37147 03 37147 09
						37112 43	37112 43	37112 11 pt 37112 13 pt 37112 15 pt	37148 03	37148 03	37148 04 37148 05
						37112 44	37112 44	37112 11 pt 37112 13 pt 37112 15 pt	37148 27	37148 27	37148 29 37148 31
						37112 45	37112 45	37112 11 pt 37112 13 pt 37112 15 pt	37149 20	37149 20	37149 21 37149 29 pt
						37112 46	37112 46	37112 11 pt 37112 13 pt 37112 15 pt	37149 39	37149 39	37149 14 37149 15 37149 18 37149 19 37149 24 37149 26 37149 29 pt



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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
3714A 01	3714A 01	37143 31	37322 21— Con.	37322 21— Con.	37322 40— Con. 37322 49	37433 03	37433 62	37433 62	38121 00	38111 00	38111 00
3714A 02	3714A 02	37143 21				37433 04	37433 69	37433 69	38122 00	36625 30 36629 44	36625 00 pt 36629 00 pt
3714A 03	3714A 03	37143 23	37322 23	37322 23	37322 47	37433 11	37433 71	37433 71	38210 10	38112 00	38112 00
3714A 04	3714A 04	37143 26	37322 25	37322 25	37322 48	37433 12	37433 12	37433 79	38210 20	38113 20	38113 00 pt
3714A 05	3714A 05	37143 49 pt	37322 27 37322 28	37322 27 37322 28	37322 55 pt	37433 13	37433 13		38244 00	38244 00	38244 11 38244 21 38244 31 38244 99
3714A 06	3714A 06					37433 14	37433 14				
3714A 07	3714A 07	37143 44	37322 29	37322 29	37322 53 37322 55 pt 37322 61	37511 01	37511 11	37511 11			
3714A 08	3714A 08	37143 49 pt				37511 02	37511 21	37511 21	38260 00	38326 00	38326 00
3714A 09	3714A 09	37143 46	37323 03	37323 03	37323 11 pt 37323 30	37511 03	37511 31	37511 31	38271 00	38324 00	38324 00
3714A 10	3714A 10	37143 47	37323 05	37323 05	37323 11 pt 37323 35	37511 04	37511 42	37511 42	38272 00	38325 30	38325 00
3714A 11	3714A 11	37143 48				37511 05	37511 44	37511 44	38273 00	38325 40	38325 00
3714A 12	3714A 12	37143 49 pt	37323 07	37323 07	37323 11 pt 37323 50	37511 06	37511 51	37511 51	38295 10	38293 00	38293 00
3714A 13	3714A 13		37323 09	37323 09	37323 11 pt 37323 54				38295 20	36625 20	36625 00 pt
3714A 19	3714A 19	37511 09				37511 59	37511 59	38296 00	38113 10	38113 00 pt	
37151 00	37151 00	37151 10 37151 50	37323 13	37323 13	37323 11 pt 37323 56	37511 10	37511 10	37511 71	38411 42	38411 42	38411 41 38411 45 38411 46
37152 01	37152 01	37152 00				37511 12	37511 12				
37152 02	37152 02			37511 13	37511 13		38411 72	38411 72	38411 71 pt		
37211 00	37211 00		37511 14	37511 14		38411 85				38411 85	38411 82 38411 83
			37511 15	37511 15			38411 87	38411 87	38411 84 pt		
			37511 16	37511 16		38411 97				38411 97	38411 98 pt
			37511 19	37511 19			38411 99	38411 99	38411 71 pt 38411 84 pt 38411 98 pt		
37244 01	37244 01	37244 13	37323 17	37323 17	37323 11 pt 37323 70 37323 75	37512 01				37512 01	37512 14 37512 17
37244 02	37244 02						37512 06	37512 06	37512 53	38421 02	38421 02
37244 05	37244 05	37244 53	37324 01	37324 01	37324 10 37324 15	37612 01	37612 25	37612 25	38421 03	38421 03	38421 99 pt
37244 06	37244 06						37612 02	37612 02	37612 35 37612 45	38421 04	38421 04
37311 01	37311 01	37311 11 pt 37311 21	37324 03	37324 03	37324 18 pt 37324 20 pt 37324 25 pt	37614 01	37614 13	37614 13	38421 05	38421 41	38421 41
37311 02	37311 02	37311 11 pt 37311 31				37614 02	37614 02	37614 15 37614 17	38421 06	38421 38	38421 38
37311 03	37311 03	37311 11 pt 37311 41	37324 05	37324 05	37324 18 pt 37324 20 pt 37324 25 pt	37615 01	37615 11	37615 11	38421 07	38421 71	38421 71
37311 04	37311 04	37311 11 pt 37311 51				37615 02	37615 13	37615 13	38421 08	38421 82	38421 82
37311 05	37311 05	37311 11 pt 37311 61	37324 07	37324 07	37324 18 pt 37324 20 pt 37324 25 pt	37922 61	37922 61	37922 59	38421 09	38421 81	38421 81
37311 06	37311 06	37311 81 pt				37922 63	37922 63	37922 69	38421 10	38421 45	38421 45
37311 07	37311 75	37311 75	37327 01	37327 01	37327 22 37327 25 pt 37327 32 37327 35 pt	37950 01	37950 01	37950 11 37950 15	38421 12	38421 12	38421 99 pt
37311 09	37311 09	37311 11 pt 37311 81 pt				37996 01	37996 30	37996 30	38421 13	38421 13	38421 33 38421 34
37313 21	37313 21	37313 98 pt	37327 03	37327 03	37327 25 pt 37327 28 pt 37327 35 pt 37327 38 pt	37996 02	37996 32	37996 32	38421 91	38421 91	38421 99 pt
37313 29	37313 29	37313 10 37313 12 37313 14 37313 98 pt				37996 03	37996 34	37996 34	38421 97	38421 97	38421 15 38421 99 pt
37316 01	37316 01	37316 13 37316 53	37327 07	37327 07	37327 28 pt 37327 38 pt	37996 04	37996 36	37996 36	38421 98	38421 98	38421 11 pt 38421 35 pt 38421 99 pt
37316 02	37316 02	37316 19 37316 59	37327 09	37327 09	37327 28 pt 37327 38 pt	37996 08	37996 08	37996 39	38423 21	38423 21	38423 31
37322 01	37322 01	37322 03 37322 04 37322 06 37322 08				37996 09	37996 09		38423 22	38423 22	38423 23 38423 24
37322 02	37322 02	37322 11	37327 11	37327 11	37327 41	37999 01	37999 01	37994 92	38431 12	38431 12	38431 04
37322 05	37322 05	37322 19 pt				37999 02	37999 02	37994 94	38440 00	36931 00	36931 00
37322 07	37322 07			37999 03	37999 03	37998 62	38450 00	36933 00	36933 00		
37322 09	37322 09	37322 15	37327 13	37327 13	37327 15	37999 04	37999 04	37998 64	38511 18	38511 18	38511 17
37322 11	37322 11	37322 19 pt				37999 05	37999 05	37998 80	38511 19	38511 19	
37322 13	37322 13	37322 17 37322 19 pt	37328 00	37328 00	37328 11 37328 21	37999 06	37999 06	37998 53	38517 04	38517 04	38517 09
37322 21	37322 21	37322 40 37322 42 37322 44	37431 11	37431 72	37431 72	37999 19	37999 19	37998 35 37998 51 37998 82 37998 84 37998 86 37998 90	38517 05	38517 05	
			37431 12	37431 12	37431 79	37999 21	37999 21	37998 88			
			37431 15	37431 15							
			37431 17	37431 17							
			37431 18	37431 18							
			37433 01	37433 41	37433 41						
			37433 02	37433 61	37433 61						

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38517 04— Con.	38517 04— Con.	38517 09— Con.	38731 06	38731 06	38737 01	39153 11	39153 11	39151 13 pt	39610 65— Con.	39610 65— Con.	39610 72— Con.
38517 06	38517 06		38731 07	38731 07	38737 02	39153 12	39153 12	39151 31 pt	39610 71	39610 71	
38517 07	38517 07				38737 03	39153 21	39153 21	39151 41	39610 93	39610 93	39610 91
38517 10	38517 10		38731 11	38731 11	38737 19	39153 31	39153 31	39151 51 pt	39610 95	39610 95	
38517 11	38517 11										
38611 11	38611 11	38611 12 38611 14	38731 13	38731 13	38736 39	39154 00	39154 11	39151 13 pt 39151 31 pt 39151 51 pt	39651 01	39630 11	39630 11
38611 69	38611 69	38611 67 38611 68	38732 01	38732 01	38732 10 38732 22	39314 24	39314 24	39314 23	39651 09	39630 15	39630 15
38611 91	38611 91	38611 81	38732 02	38732 02	38732 14 38732 24	39314 25	39314 25		39651 11	39630 41	39630 41
38611 98	38611 98	38611 43 38611 99	38732 03	38732 03	38732 16 38732 26	39443 46	39443 46	39443 44 39443 45	39651 19	39630 51	39630 51
38613 17	38613 17	38613 27 38613 46	38732 09	38732 09	38732 18 38732 20 38732 29 38732 30	39443 47 39443 98	39443 47 39443 98	39443 99	39651 21	39630 61	39630 61
38613 89	38613 89	38613 98				39447 16	36629 46	36629 00 pt	39651 29	39630 98	39630 98
38613 97	38613 97	38613 61	39113 11	39113 11	39112 11 pt	39493 01	39493 01	39494 62	39654 22	39641 22	39641 22
38615 01	38615 01	38615 11 38615 17 38615 32 38615 37	39113 21	39113 21	39112 21 pt	39493 02	39493 02	39494 63	39654 23	39641 23	39641 23
38615 02	38615 02	38615 63	39113 31	39113 31	39112 31 pt	39493 05	39493 05	39495 99 pt	39654 31	39641 31	39641 31
38615 03	38615 03	38615 73 38615 74	39113 41	39113 41	39112 41 pt	39495 05	39495 05		39654 33	39641 33	39641 33
38615 04	38615 04	38615 75	39113 98	39113 98	39112 98 pt	39495 72	39495 72	39495 78 39495 79	39654 39	39641 39	39641 39
38615 05	38615 05	38615 57 38615 64 38615 65 38615 76 38615 81	39114 11	39114 11	39112 11 pt	39495 81 39495 88 39495 89	39495 81 39495 88 39495 89	39495 99 pt	39656 20	39642 20	39642 20
38619 00	38619 00	38619 41 38619 43 38619 45	39114 21	39114 21	39112 21 pt	39495 92	39495 92	39495 90 pt	39656 21	39642 21	39642 21
38731 01	38731 01	38734 11 38734 12 38736 11	39114 31	39114 31	39112 31 pt	39495 93	39495 93	39495 91 pt	39656 32	39642 32	39642 32
38731 02	38731 02	38734 22 pt 38736 13 pt	39114 41	39114 41	39112 41 pt	39495 96	39495 96	39495 90 pt 39495 91 pt	39656 33	39642 33	39642 33
38731 03	38731 03	38734 21 38734 22 pt 38736 12 38736 13 pt	39114 51 39114 61 39114 71	39114 51 39114 61 39114 71	39112 98	39495 98	39495 98	39495 99 pt	39656 51	39642 51	39642 51
38731 05	38731 05	38736 31 38736 32 38736 33	39141 41 39141 43 39141 69	39141 41 39141 43 39141 69	39141 66	39496 01	39496 01	39494 65	39656 71	39642 71	39642 71
			39142 35	39142 35	39142 34 39142 36	39496 02	39496 02	39494 68	39656 81	39642 81	39642 81
			39142 41 39142 43	39142 41 39142 43	39142 61	39496 03 39496 04	39496 03 39496 04	39494 70	39656 89	39642 89	39642 89
			39142 55	39142 55	39142 54 39142 56	39496 05	39496 05	39494 69	39991 51 39991 61 39991 69	39991 51 39991 61 39991 69	39991 67
			39142 69	39142 69	39142 61 pt	39496 06	39496 06	39494 70 pt	39993 00	39993 00	39993 36 39993 61
						39523 00	39523 00	39521 00 39522 15	39997 11 39997 51	39997 11 39997 51	39997 00
						39524 13	39524 13	39522 13	39998 13	39620 13	39620 13
						39524 19	39524 19	39522 19	39998 15	39620 15	39620 15
						39610 65	39610 65	39610 72	39998 17	39620 17	39620 17
									39998 21	39620 21	39620 21





# PUBLICATION PROGRAM

## 1987 CENSUS OF MANUFACTURES

Publications of the 1987 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

### Preliminary Reports

#### Industry series—83 reports (MC87-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the U.S. and States are released in one report.

### Final Reports

#### Industry series—83 reports (MC87-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

#### Geographic area series—51 reports (MC87-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MSA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

#### Subject series—7 reports (MC87-S-1 to -7)

Each of the seven reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, type of organization, water use in manufacturing, textile machinery in place, distribution of sales by class of customer, manufacturers' shipments to the Federal Government, and a general national-level summary.

#### Reference series—1 report (MC87-R-1)

The Numerical List of Manufactured and Mineral Products includes a description of the principal products and services published in the 1987 Censuses of Manufactures and Mineral Industries.

#### Location of Manufacturing Plants—1 report (MC87-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and zip codes for each State. (This report is available only on magnetic tape and CD-ROM.)

### Analytical Reports—3 reports (AR87-1 to -3)

#### Exports From Manufacturing Establishments (AR87-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

#### Selected Characteristics of Manufacturing Establishments That Export (AR87-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

#### Indexes of Production (AR87-3)

The indexes presented in this report are designed to measure the change in physical output of each manufacturing and mineral industry between 1982 and 1987.

### MICROFICHE

Every final published report in the 1987 Census of Manufactures will be available on microfiche.

### PUBLIC-USE COMPUTER TAPES AND COMPACT DISCS

Data from the final industry series, geographic area series, and the Location of Manufacturing Plants report will be available on public-use computer tapes and compact discs—read only memory (CD-ROM). These tapes will provide the same information found in the final reports. Computerized data products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, DC 20233.

### OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, transportation, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1987 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.















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